tians

Belone No 45-7

D. 25; A 26; V. 6, P. 14; C, 4, 1, 6, 7, 1, 4

This species is much elongated, and strongly compressed particularly along the ventral region. The greatest depth is over the ventral fins. The outline of the body between the head and the ventrals is slightly concave and more so between these fins and the anal fin. The dorsal region is nearly horizontal between the head and dorsal fin.

The dorsal commences at a point mid=way between the caudal and ventrals, its anterior portion is drawn up into a long point, and its posterior portion is arched. The anal fin is somewhat similar to the fin above, a trifle longer, more acutely pointed, its hinder portion lower and does not approach quite so near the caudal. Ventrals inserted at a point midway between the base of the caudal and the hinder angle of the mouth, and are concave. Pectorals sub-falci=form. Caudal bifurcate the lower lobe the longer.

Color silvery, back indigo blue. Irides silvery veined blue. A range of dark

blue spots between the dorsal and anal fins. two spots across base of snout. Rostrum dusky. P3. steel blue. V3. dusky shade. C. dusky. A. white, centers or lobes dusky. D. raised steel blue.

Length 38 inches.
Hab. Sandwich Isls.

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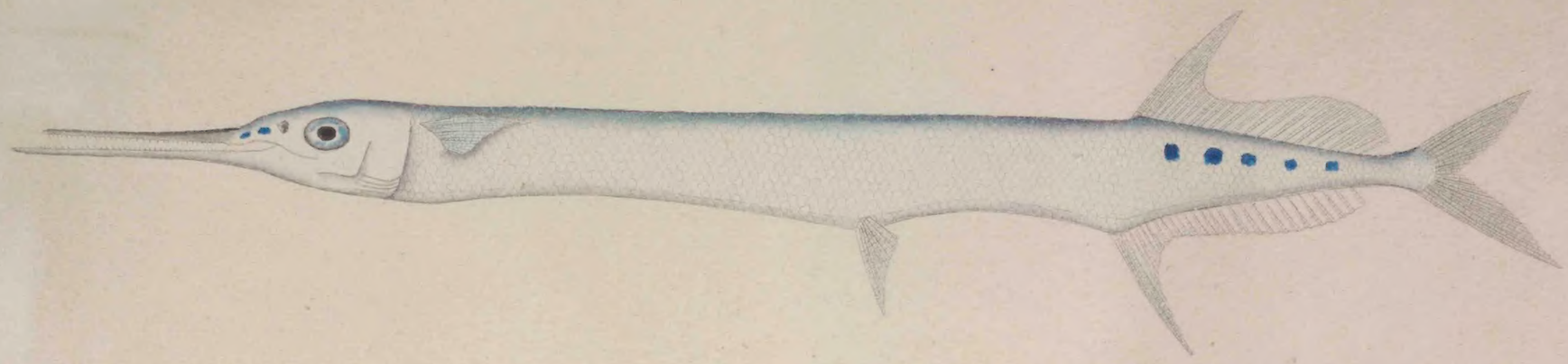

Belone lucius
mihi pict

457

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dussumieri
Hemiramphus No 416

D. 15; A. 14; V. 6; P. 12; C. 3, 1, 6, 7, 1, 4.

This species is more slender and thicker than *H. amboea*, the depth being but little greater than the thickness, which former equals about one-eights of the distance between the end of the upper jaw and the base of the caudal fin. The upper line of profile from the head to the dorsal fin runs horizontal and the ventral region is slightly arched. The head, measuring from the end of the upper jaw to the hinder margin of the gill covers, is three thirteenth of the distance from the former point to the base of the caudal fin. The beak is slender, and a trifle longer than the head. The large eyes are horizontally oval, touching the upper line of profile and their length nearly one-third that of the head. The interorbital space equals in diameter the length of the eyes and is slightly concave.

The dorsal fin passes over a base equal to the distance between the end of the upper jaw and the hinder border of the eyes. Its height is one-third the length of its own base and its upper margin is oblique and deeply concave. The empty space

between its termination and the base of the caudal is equal to the greatest diameter of the eyes. The similar anal fin is shorter on its base and a trifle more removed from the base of the caudal. The broad ventrals when laid back reach half the distance between their base and the vent. The pectorals are nearly as long as the dorsal base, and the caudal equals in length the distance from the end of the upper jaw to the hinder opercle margin.

The upper region is light greenish slate, flanks greenish silver and the belly pale bluish green. A narrow brilliant rich blue line extends from the base of the head to the caudal fin, and a line of light greenish traverses the middle of the back. On each side of the dorsal line is slender emerald green line. Microscopical indigo blue dots along the lower carina. Muzzle, region of the eyes and gill covers tinged with rich light blue, and a tinge of light green on the top of the head. Beak dark slaty, tipped with reddish. Irides silvery. All the fins colorless except a dusky shade on the caudal and upper anterior portion of the caudal. Length 12 inches.

Hab.—Society Isls.

Native name Ihi

No 415

371

Hemiramphus far ~~caribaeus, Gosse~~

B. 13; D. 2/11; A. 1/9; V. 1/6; P. 13; C. 4, 1, 6, 7, 1, 5.

Both upper and lower outlines are gently and similarly arched. The greatest depth of the body equals one-seventh of the distance between the end of the upper jaw and the tip of the lowerlobe of the caudal fin. The greatest thickness is two-thirds of the above mentioned depth. The head measuring from the tip of the long beak to the hinder rounded gill cover, comprises a trifle more than one-third of the total length of the fish. The distance from the anterior limb of the orbit to the end of the beak equals a fourth of the fish. The large eyes are horizontally oval, their length occupying one-third of the distance from the end of upper jaw to the hinder termination of the head; they are contiguous to the upper line of the head, and are situated a trifle nearer to the end of the upper jaw than the hinder operele margin. The interocular space equals the greatest diameter of the eye in width.

The dorsal fin is a trifle longer

than dorsal, the former equalling the distance from the anterior border of the eye to the hinder limb of the opercle. Its upper margin is very oblique and profoundly concave. The anal commences beneath the middle of the dorsal fin and does not approach so near the caudal as that fin. The ventrals are broad, the hinder rays longer than the anterior ones and the lower margin is concave. The pectorals are a little longer than the base of the dorsal.

Color silvery, reflecting violaceous, and an obsolete band of the latter tint extends from the pectoral axilla to the caudal fin. The upper half of the body is decorated with several large irregular dusky spots, disposed in a longitudinal row. The belly is greenish white and the dorsal region is changeable in its tints according to the direction of the light which falls upon it, but generally olive green and bluish. A rich blue spot marks the pectoral axilla. The rostrum is blue black above, brownish beneath and tipped with orange. A rich metallic blue tint about the mouth and eyes. Irides silvery tinged blue. Dorsal and caudal light steel blue with a yellowish tinge. Anal and pectorals nearly colorless. The base of the ventrals with a blue spot and shaded transversely with dusky. Length 15 inches.

Hab.— Viti Isls. Native name Ambosa

H. dussumieri

H. far

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Hemiramphus No 471 ? Longirostris

D. 20; A. 21; V. 6; P. 12? C. 3, 1, 7, 8, 1, 4

Color along the dorsal region is greenish slate, silvery beneath. and the top of the head indigo blue. Rostrum black. Irides silvery. All the fins colorless except the caudal which has a dusky tinge.

Not having any description I can only remark that its principal character consists in its large pectorals dorsal and caudal fins which are unusually developed.

Length 10 in Hab. Sandwich Isls.

if longirostris, proportions
of head & beak & dorsal fin

Hemiramphus depauperatus No 472

D. 14; A. 12; V. 7; P. 10; C. 3, 1, 7, 8, 1, 4.

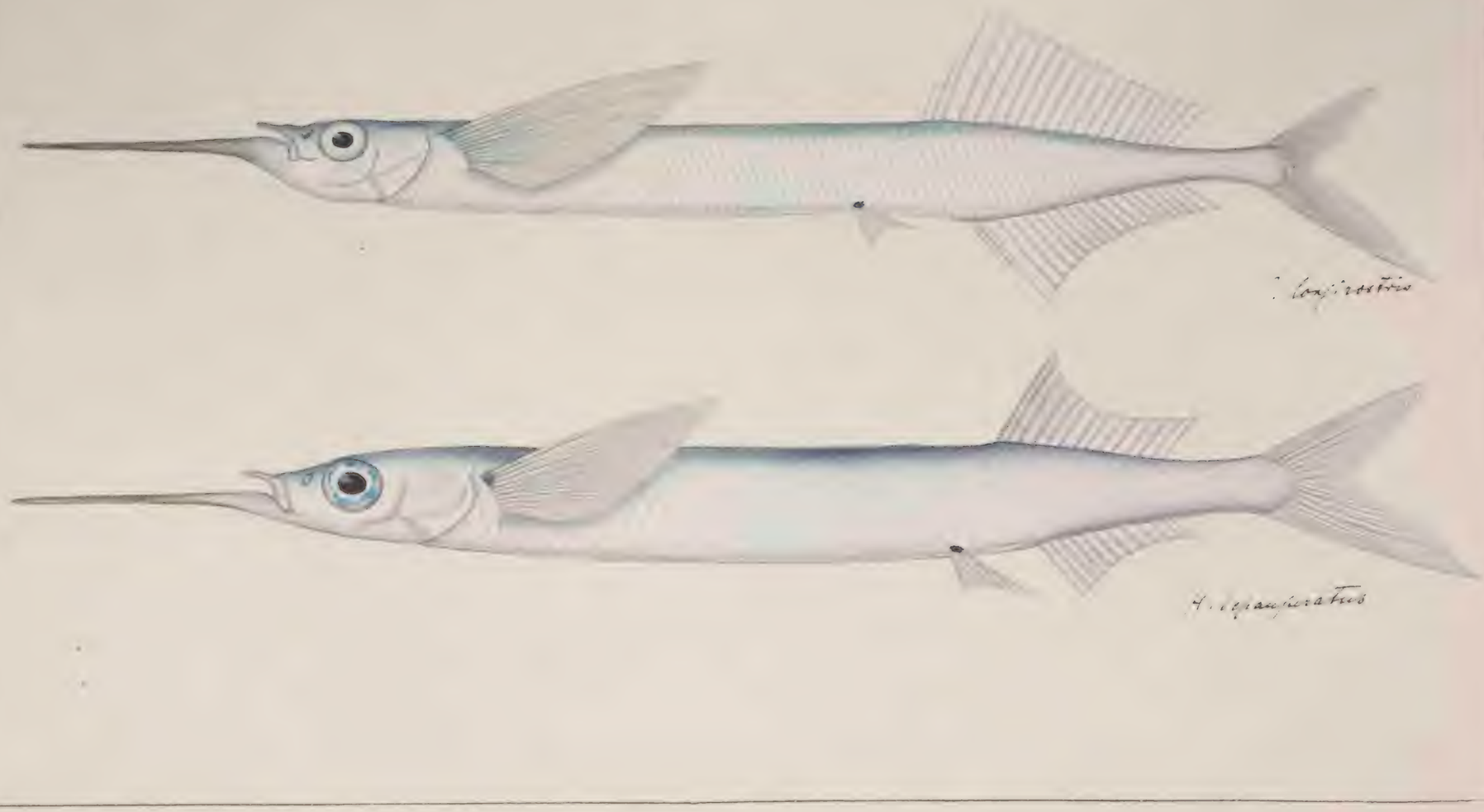
The head comprises one-fifth of the total length, and the rostrum is a little more than a fifth of the total length. Eye large, sub-circular, its greatest diameter entering about four times in the length of the head. The cornea is horizontally oval.

The dorsal fin commences at a point corresponding to the middle of the empty space between the ventrals and anal fin, and is concave above. The anal commences beneath the seventh dorsal ray, and coterminates with that fin, and is similar in shape but much smaller. The ventrals are rather small, the hinder ray prolonged into an acute point. The pectorals are large being one-sixth the total length of the fish.

Color indigo blue above, sides and belly silvery. Rostrum black, the lower line orange. Irides silvery varied with rich blue. A blue spot marks the base of the pectorals and ventrals. Fins uncolored except a dusky shade on dorsal.

Length 12 in. Hab. Sandwich Isls.

Native name Aeu.



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Halocypselus, sp. nov.

B. 6; D. 11; A. 12; P. 6; V. 6; C. 12, 1, 6, 7, 1, 8.

The greatest depth is about one-sixth of the total length, and the head is about one-fourth of the same, constituting about one-fourth of the fish, caudal excluded. The large circular eye enters three times in the side of head and closely approximates the upper profile. The interorbital space is greater than the diameter of the eye.

The dorsal fin rises at a point a little posterior to the middle of the body, and consists of a base equal to half the distance between its origin and the humeral scapular angle. Its height is about half the length of its base and the terminal margin is concave. It tapers away posteriorly, leaving an entire space between it and the caudal a little less than the height of the fin.

The anal fin is smaller but otherwise quite similar to the fin above.

The ventrals are inserted nearer to the head than to the anal fin. They are four-rayed, the posterior ray as long as the anterior and when laid back reach just half way to the anal fin.

The pectorals extend posteriorly as far as the base of the caudal and the third ray is the longest.

The caudal is bilobed.

Color brilliant silvery, blue-black above, which the two colors meet there is a brilliant azure blue reflection.

Sides brilliant silver, reflecting rich violet
cross bands blue-black, pectorals dusky
with darker stand. Caudal black with steel.
The other fins nearly colorless.

This specie was captured about
200 miles east from the Kingsmill Is.

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125

371

Exocoetus evolans

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575
(no M. SS.)

Exocoetus

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11/1

376

Plotosus anguillaris, Bloch

B. 11; D. 1-7-8; ad. 1; V. 11; P. 10; C. 5.

Form sub-anguilliform, becoming strongly compressed posteriorly, and entirely naked, with no cleft. The lateral line is slightly arched over the pectoral. The head is oblong, convex in front profile, wider than deep, and transversely furrowed in front. Its length as compared to the entire fish is as two to nine. The eye is oval or roundly oval, superior in the adult, and placed nearer to the end of the snout than the hinder termination of the gill cover; their longitudinal diameter enters five times in the length side of head. Between in front the head is subquadrangular, owing to the flatness of the top, sides and beneath. The mouth is furnished with 8 barbels, four on either side, two on the end of the upper jaw, one at each angle of the mouth and the other pair on the lower jaw. The mouth is broad, protractile, slightly festooned, the upper jaw projecting beyond the lower, and the lips are thickened, [illegible]

The dorsal fin is placed a short distance posterior to the pectorals, its height equalling the greatest depth of the body, much higher than long and the first spine is very stout and dentated on either side with a row of hooked spicules. The second dorsal commences over the centre and gradually tapers away posteriorly by which it unites to anal fin. The anal fin is shorter than the second dorsal, and the ventrals are small, and [illegible]

hind back reach the anal fin. The large pectorals are armed like the first dorsal with a serrated stout spine.

Color olive-green, bluish white beneath the head and belly. Two pale bands transverse nearly the whole length of the fish. Sides brown, separated anteriorly crimson brown the other reddish. Dorsals olive brown, the first on colorless above. Anal pale brownish, margined with blackish. Ventral reddish. Pectorals colorless. Pectorals reddish.

Length 6 inches.

Hab.—Kingsmill Isls.

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3/4

375

Clarias anguillaris

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cm
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377

2. Saurus gracilis. Lucy et Gaim.

Saurus gracilis, Lucy et Gaim., Voy. Freycin., p. 224.

B. 10; D. 2-9-1; A. 2-7; V. 18; P. 12; C. 5,1,7,5,1,4.

The general aspect of this Saurus is elongate, slender, sub-cylindrical, gradually tapering either way from the origin of the dorsal fin. The greatest depth of the body, which is a trifle less than its thickness, is as compared to the total length two to fifteen. The head is pointed, depressed above, and constitutes just one-fifth of the entire fish. The eye is circular in shape, of moderate size, and its upper limb is even with the upper line of profile. The interorbital space is slightly concave.

The dorsal fin is inserted about midway between the tip of the snout and the base of the caudal. Its height equals the length of its own base, and its upper margin is concave anteriorly, and convex posteriorly. The anal commences second dorsal is nearer to the base of the caudal than the first fin. The mouth is small, concave along its lower margin, and inserted at a point

midway between the first dorsal and the base of the caudal. The ventrals are very large, and the second, third, fourth and fifth rays are bifid. The pectorals are small, their hinder margins shaped like the first dorsal. Caudal forked.

Color pale yellowish gray, mottled with brown which assume broad irregular cloud-like vertical bars. Belly, bluish white. Upper parts of the head and tessellations on the jaws, brown. Sides brownish orange. All the fins have colorless membranes and rays articulated with olivaceous-brown and amber-yellow.

Length, 12 inches.

Habitat- Society, Sandwich and the Kingsmill Isls.

Vernacular name at the two former localities "Stac"

Remarks.- This species is rare at the above mentioned localities. The large fine specimen from which the drawing and description were made I obtained at the former group. I suspect the Dentex me-bulosus (Banks and Solander, Parkinson, Icon. 113. Bib. Banks) which was obtained at Tahiti, is identical with this species. Sir. John Richardson gives China and Japan as the location of this widely distributed species.

377

Saurida gracilis

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cta 322

Genus Scopelus, Bon.

Body elongate, oblong, compressed, and tapering away from the head to the tail. Scales large, brilliant, pectoral, oval, their posterior margin slightly undulated, and that portion of the surface is marked by exceedingly fine waved striae which run parallel to the margin. The exposed margin is fringed with slender spinules which increase in size on the posterior scales of the body. The lateral line has a gentle descent and the tubes are simple. Head long, snout short and obtuse. Mouth large, slightly oblique. Jaws large, ribbed above, elongate, tapering to a point and the sides are perforated. Teeth fine crowded villiform. Eyes anteriorly depressed and placed close to the snout, lenticular double, elliptical. Three or four large scales on the opercular bones. Operculum emarginate above its posterior angle. Gill apertures open from the nape to the middle of the lower jaw. Pectorals small and close to the eye. Dorsal opposite to the space between the pectoral and the analogue, rudimentary, adipose large, just posterior to the fin alone. Ventrals beneath the origin of the dorsal. Pectorals large, caudal bifurcate, and the rudimentary rays obvious.

Scopelus oculatus, Garrett

D. 3/ic, 1d. 2/12; A. 1/7; P. 14; L. s. 5, 5, 5, 1, 4.

The greatest depth of the body, which is at the base of the head, equals one-fifth of the total length of the fish. The lateral line passes over 37 to 38 scales, and eight horizontal rows may be counted between the dorsal and ventral fins; those on the sides of the abdomen are the largest. The head is nearly as deep as long, which latter contributes one-fourth of the total length, caudal excluded. The upper profile is precipitately convex. The eyes are oblique, oval, their orbits rising above the upper line of profile, and their length equals half the length of the head. The interocular space is ridged.

The dorsal fin is situated about midway between the end of the snout and the base of the caudal fin; its height, which exceeds the length of its base equals the depth of the body beneath; its upper margin is very obliquely concave. The three anterior rays are unbranched. The ventral, median dorsal is inserted midway between the first dorsal and the base of the caudal.

The anal fin commences opposite to the end of the dorsal base, and equals in length the greatest depth of body. Its depth is but a trifle less than the dorsal, and there is a free space between its hinder termination and the caudal equal to the base of the former fin. Its two anterior rays are unbranched.

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The ventrals are inserted just mid-
way between the head and the
caudal fin, but when laid back do
not reach the latter by nearly their
own height. The large pectorals reach
back as far as the middle of the dorsal.
Color along the dorsal region
deep blue; the region of the cheeks
reflecting metallic azure blue. The
sides burnished silver and blackish
beneath the belly; and few minute
brilliant emerald green dots with
black centers are scattered along
the lower half of the body, and a
row of the same along the base of
the dorsal fin. The head is blackish
above, silvery on the sides and light
blue beneath the eyes. Sides silvery
margined with blue above. The fins
are nearly colorless.

Length 4¾ inches.

Hab.—Sandwich Isls.

A very rare fish called by
the natives "Iaa."

678

Scopelus

322

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379

Genus *Hygadon*, Garrett

Body elongate, slender, strongly compressed. Head moderate, and like the body very much compressed. Mouth large, the gape extending nearly as far back as the preopercular margin; the lower jaw the longer; teeth very long, slender, particularly the anterior ones, which when the mouth is closed pass outside of the jaw. A single small dorsal inserted a little posterior to the pectorals, which latter are low down on the breast. Anal small approximating the caudal. The ventrals are long, their point of insertion being a short distance in advance of the middle of the body. Caudal forked.

This genus is probably closely allied to *Chauliodus*, Schn. The specimen which was before us when we drew up the above brief diagnosis was completely denuded of scales and otherwise very much mutilated. They seem to have been rather large.

Hygadon abdominalis, Garrett.

R. 1; L. 6½; A. 12; V. 6; P. 12½; C. ?.

The head, which is rounded above

in its profile, comparies about one-seventh of the entire length of the fish. The interocular space is deeply concave. The long slender teeth in the upper jaw, when the mouth is closed, project below the lower line of the under jaw, and the two anterior ones of the lower jaw extend above the eyes. The lower edge of the maxillary is serrated. The slender body tapers gradually from the head, and is ornamented along the belly with four longitudinal rows of silvery points.

The dorsal fin is higher than long and its rays are slender. Pectorals moderate, their tips reaching as far back as the hinder termination of the dorsal. Anal small, obtuse along its base, which latter slightly exceeds its height. Ventrals are inserted about midway between the end of the snout and the anal fin. Caudal forked.

Length, 9¼ inches.

Habitat.—Society Isls.

Remarks.—This most singular fish was captured in the open sea near the above group of islands. When I received the specimen it was much faded and mutilated, so that I could give but an imperfect description. It was too much disordered by immersion in spirits to determine its color.

379

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? ~~apicatis~~ cormanni

Engraulis Ho 516

D. 11; A. 34; V. 7; P. ?; C. 2, 1, 8, 7, 1, 2

The dorsal ray is more than half the greatest depth of the body, is contained in the total length one time and three eleven. The third ray is half of the above mentioned depth, and the head comprises a fourth of the fish, exclusive of C. The eye is circular, its diameter one-fourth the length of the head, and the interorbital space equals the diameter of the orbit. The eyes are situated so that the line of the mouth is exactly midway between the anterior limit of their orbit and the end of the snout, which latter is quite prominent and rounded. The hinder tip of the maxillary reaches quite close to the margin of the interopercle. The teeth are minute.

The dorsal fin commences rather nearer the end of the snout than the base of the caudal fin; it is subfalcate in shape and deeper than long. The fin tapers posteriorly, its anterior and the last ray is very low.

The anal fin is quite long on its base, being twice as long as the dorsal, and commences just posterior to that fin. Its depth equals half its length, tapers sharply posteriorly, and the lower margin is concave.

The pectorals are inserted at a point immediately in front of

the dorsal fin or midway between the
pectoral and anal fin.

The pectorals are quite near the
lower line of breast, and the caudal
is deeply forked.

Color silvery, the dorsal
region deep olive, and an orange yellow
spot near the origin of the lateral
line. The anal is brownish and the
vides silvery; all the fins colorless,
except the dorsal and caudal which
have a light red tinge.

Length 5 inches.

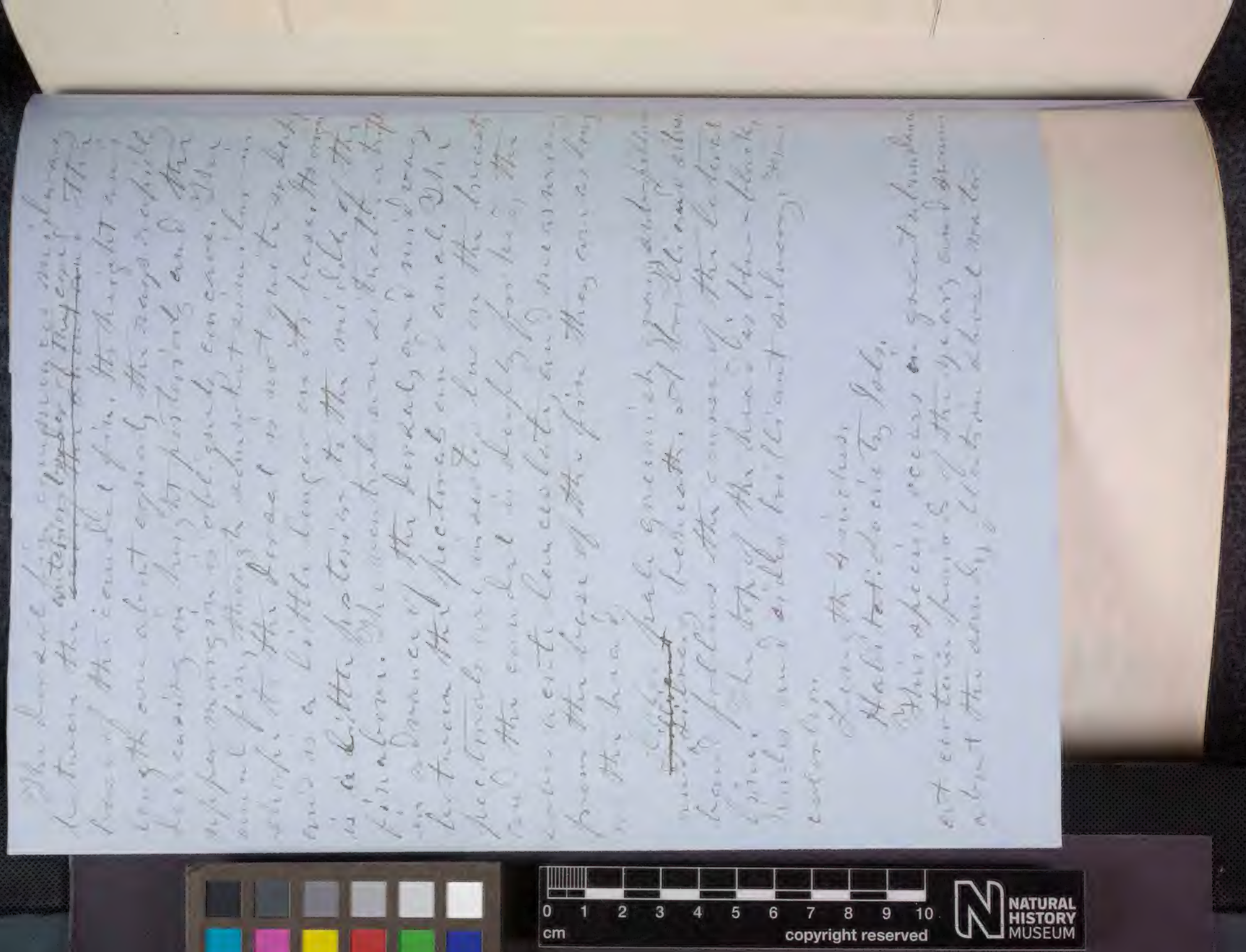
Hab.—Samoa Is.

doubtful

Chirocentrus arcturus Jordan & Gilbert

B. 14; D. 16; ech. 17; V. 8; P. 15; C. 3, 1, 7, 5, 1, 2.

The general aspect of this species is rather slender, and the two entirely similar in their external characters. The greatest depth of the body is a little more than one-sixth of the total length, and the greatest thickness is two-thirds of the above mentioned depth. The scales are rather large and easily distinguished. The lateral is nearly horizontal. The head falls a little short of a fifth of the total length, and the large eyes are circular, their diameter contained four times in the length of the head, and they are distant less than their diameter from the end of the snout. The mouth is nearly level with the lower line of the profile, and over their diameter apart from each other. The snout is prominent, rounded, and the large mouth is cleft far behind the eyes. The lower jaw is included (is shorter) and with a single range of minute recurved teeth, on the latter they occupy the lower edge and are continued with a kind of tip. The nostril openings are distant about a diameter between the eyes and the end of the snout. The preoperculum is dusky-margined, and the gill apertures are continued



Engraulis

331
335

Engraulis ~~apicentid~~
encrasicrani

336
330

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gibbosa

Clupea No 478

D. 17; A. 15; V. 8; P. 17; L. l. 41; 9; 8; 4; 5.

The dorsal begins at more than the ventral, and the greatest depth of the body is one-fifth of the total length. The belly is strongly compressed, sharp and serrated. The head is one fourth of the total length, exclusive of the caudal lobe. The eyes are large, vertically oval, their length entering three times in the side of head, and is less than the interspace between the tips of the lateral line and the end of the snout. The jaws are edentate, and the hinder tip of the maxillary extends back as far as the centre of the eye; the lower edge is finely denticulate.

The origin of the dorsal fin is a trifle nearer the end of the snout than the base of the caudal fin, and is of nearly equal height and length, concave edged, and the last ray is half the height of the anterior branched ray. The ventral commences a little behind the termination of the dorsal than the base of the caudal; it is small, tapering, and shorter than the dorsal. The pectoral

are obliquely fan-shaped, inserted beneath
the middle of the dorsal, and decurving be-
tween the pectorals and anal, and when
bent back reach half way to the latter
fins. The pectorals in length equal
the height of the dorsal, and the caudal
equals the greatest depth of the body
in length.

Color in life, light green with dusky
edges, and in certain light may be
seen a bright emerald green band extending
from the base of the head to the base
of the caudal fin, and small ochre yellow
spot under the origin of the band and
a similar one beneath. Iris dusky
with yellow, green and silver. Fins colorless
except a dusky tinge on dorsal and caudal.

Length 5¼ inches.

Hab. Viti Islands

Native name Kedrita

332

Clupea gibbosa

478

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cm
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Family Clupeidae, Bonaparte.

In this family the body is always covered with scales, but owing to their deciduous nature are rarely seen in preserved specimens. The adipose dorsal fin which characterizes the Salmonids, Salmonoids and Scopelids and others, is entirely wanted here. The upper arcade of the mouth is formed by the premaxillar bones and sideways by the maxillaries. The dentation varies according to the genera. The pseudobranchiæ exist in the structure of these fishes. The stomach is provided with a cul-de-sac, and the pylorus with numerous caecal appendages. The swimming or air bladder being simple, although in communication with (through an air duct) the throat.

Genus Clupea, Artedi.

Body elongate, compressed, particularly along the belly, which forms a sharp knife-like edge, which in some species is serrated. Head scaleless, well developed. Premaxillary bone provided with minute teeth. The lower jaw projects beyond the upper, and furnished with very minute teeth. Dorsal fin small, situated about the middle of

the length of the body. The caudal is forked and the anal is quite low. The ventrals are inserted under the dorsal. The pectorals are rather small and placed low down on the breast. Lateral line straight.

Clupea ~~unifasciata, Gorath.~~ sirm, Jordk

B. 5; D. 16; A. 18; V. 7; P. 15; C. 3, 1, 5, 7, 1, 2.

The depth of the body equals the length of the head, or a little more than one-fifth of the total length of the fish. Eyes large, vertically oval their length entering three times in the length of the head. The maxillary reaches nearly the center of the eye. The height and length of the dorsal are about equal. The anal passes over a base equal as long as the dorsal. Ventrals half as long as the head.

Color brilliant silvery. Back dark green. A greenish band traverses the whole length of the upper third of the body, and marked anteriorly with an orange spot. Lower jaw tipped, light blue. Sides silvery. Fins colorless.

Length, 4 inches.

Habitat — Kiaugau'll Isls.

Vernacular name, "Setarabuti"

Remarks.— This elegant species was obtained in great numbers at the above mentioned locality. The colors were quite similar from the fresh fish, and the drawings together with the description are from specimens preserved in spirits.

333

Clupea bitentaculata, Gronow.
atricauda

B. 5; D. 17; ad. 20; V. 8; P. 15; C. 19.

The greatest depth of the body is about the same as the length of the head, or more exactly one-fourth of the total length, caudal excluded. The lower outline of the body is more arched than the upper. Eyes large, oblique, oval, their greatest diameter being one-third the length of the head. The hinder tip of the maxillary reaches a vertical passing a little behind the anterior limit of the eye. There are eleven rows of scales on the greatest depth of the body.

The dorsal fin is a little deeper than long, obliquely concave above. The length of the anal equals the height of the dorsal, and is slightly concave along its lower margin. The ventrals are inserted midway between the end of the snout and the base of the caudal. Caudal deeply forked.

Color: sides brilliant silvery; dorsal region brilliant blue, in certain lights reflecting sea-green. Above the lateral line each longitudinal row of scales is bordered by an obsolete greenish line. Tip of the lower jaw greenish. Sides silvery shaded with green. Fins colorless, except the caudal fork which have black tips.

Length, 3 to 5 inches.

Habitat. - Society and Hervey Isls.

Vernacular name at the former location, "Aua".

Remarks. - An extremely common species, characterized by the bluish tint on the upper half of the body and the black tipped caudal.

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240
Albula glossodon 385

Genus *Butirinus*, Commers.

Body elongate, compressed, the back rounded and the belly flattened. Scales moderate. Lateral line median and decurved. Head conical, protuberant, snout prominent, projecting over the mouth as in the genus *Engraulis*. Mouth small, jaws like those of a *Clupea*, the upper and the longer. Maxillary teeth displaced in front by intermaxillary bones, and minute teeth on the roof of the mouth and tongue. Dorsal fin short, originating in the abdominal region. Anal very small, inserted nearer to the caudal than the ventrals. Ventrals with an elongate basal scale, and situated about the middle of the body. Pectorals with a similar elongate scale. Caudal forked.

These fishes are distinguished by their silvery color, from that of all other clupeoid fishes by the minute teeth on the tongue, vomer and palatines.

Butirinus ~~*hadditionalis*~~

B. 13; D. 13-15; A. 1-2; V. 1-2; P. 1-15; L. l. 45, 48-50.

Both dorsal and ventral spines are gently arched, nearly similar in outline, both commencing at the snout and terminating at the tail. The greatest depth taken at the origin of the dorsal fin is about one sixth of the total length. The thickness at the same place equals two-thirds of the above mentioned depth. The head, which comprises one fifth of the fish is flattened above, its length as the diameter of the large, circular eye is contained five times in the side of the head most distant contiguous to the inferior rim of the orbit. The nostrils small, superficial, situated a little nearer the eye than the end of the snout, the anterior one oval the other slightly triangular. The small mouth is nearly horizontal, and the snout is rounded off. The gill covers are regularly, and widely serrated. The fins are of the ordinary

branch is expressed. The lateral lines take one contiguous and horizontal. There are about nine rows of scales between the lateral line and the nearest pectoral fin, and the pectoral fin contains.

The commencement of the dorsal fin is a little nearer to the end of the snout than the base of the caudal. Its height, which exceeds the length of its base, nearly equals the depth of the body, and its hinder margin is obliquely and obliquely concave. The first branched ray is the tallest, being twice the height of the last, and the former is preceded by four undivided ones. The interspace between the anal and caudal equals the height of the former, which is only half as deep as the dorsal fin. Its base is a little less than its own depth, and, like the dorsal is obliquely concave. The ventrals are inserted beneath the posterior base of the dorsal, fan-shaped, and when folded back their tips reach the anal. The snout is a little nearer the ventrals than the anal fin. The pectorals are falcate & very long, as

time

with the secondary margin; their length equals the base of the dorsal fin, much less the distance to the ventrals.

The caudal is deeply forked, its upper lobe equal in length the space between the ventrals and pectorals.

Color brilliant silvery; iridescent with numerous obsolete longitudinal darker lines, corresponding to the rows of scales. Dorsal region light wood brown or olive brown. Head tinged yellow. Sides silvery. Dorsal dusky. Caudal with a faint yellowish tinge, ventral whitish. Pectoral and pectinals faintly tinged yellow.

Length, 2 feet

Habitat: Lincoln Lake, Sandwich Lake, Loon Lake, Kingsmill Lake, Ivanna Lake,

The aboriginal name of this species at the Sandwich Island Lakes is "Opio." The drawing and description are from a specimen given long from the Lake Location.

Albula glossodon

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Elops hawaiensis

Specimen No 428 (incorrect figure)

D. 4/19; A. 3/13; V. 1/13; P. 1/17; C. 7, 1, 9, 8, 1, 6.

This species of Elopidae was obtained at the Sandwich Islands, where it is excessively rare. At the time I obtained the specimen I made a drawing of it, but neglected at the time to draw up a description, which is to be regretted as I have never seen a second example.

The drawing is 3/4 th. nat. size.

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Elops hawaiensis

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Genus

Form elongate oblong, strongly compressed; abdominal region trenchant. Head moderate, sub-conical, pointed. Mouth large, oblique, lower jaw the longer. Jaws like Clupea, and furnished with very fine teeth. Eyes large. Nostrils double, approximating. Sides of the lateral line arborescent. Scales large, easily detached, sub-circular, anterior margin sub-truncate, crenulate, and the posterior margin rounded. A few radiating striae on the anterior field. An elongate scale at the upper base of the pectorals and ventrals. Abdominal scales not serrated. Branchial rays 24. Fins like Clupea.

Megalops cyprinoides

B. 24; D. 6-15; A. 3-22; V. 1-9; P. 15; C. 5, 1, 9, 8, 1, 1, 4.

The dorsal outline is slightly arched, from the end of the snout to the origin of the dorsal fin, whence it has a gentle descent, in a nearly

straight line to the base of the caudal fin. The lower profile commences at the end of the lower jaw, curves suddenly down as far as the pectorals, whence it runs nearly horizontal to the anal fin, thence extends obliquely up to the caudal trunk. The greatest depth of the body, which is beneath the dorsal fin, equals the length of the head, or nearly a fifth of the total length. The eyes are sub-circular, contiguous to the upper line of profile, and distanted nearly once their diameter from the end of the muzzle. A line drawn from the end of the upper jaw to the middle of the caudal fin cuts the centre of the pupil. When the mouth is closed the prominent lower jaw slightly projects the upper line of profile. The hinder tip of the maxillary is on a vertical with the posterior limb of the orbit. The praeoperele is striated, and exhibits a prominent hinder corner. The lateral line, which passes over 40 scales, has a gentle descent in a nearly straight line to the tail. There may be enumerated eleven

horizontal rows of scales between the dorsal and ventral fins.

The dorsal fin commences just midway between the base of the caudal and the end of the snout, and has a base equalling half the length of the head. Its altitude is much greater than its length, and its upper margin is obliquely and profoundly concave. The six anterior rays are undivided, the first minute, the others gradually longer. The anterior, which, like the dorsal is pointed, is less than the length of its own base, which latter equals the height of the dorsal fin. The first ventral rays on a vertical with the origin of the dorsal, and their length equals the depth of the anal fin. The pectorals are larger than the ventrals. The

caudal is deeply forked, the lobes broadly lanceolate, the upper one nearly one-fourth the total length of the fish.

Color: along the dorsal region the scales are dark steel, margined with pale olive, the flanks silvery gray, and the top of the head light blue, ~~and~~ ~~with~~ traceries, and ~~with~~ ~~th~~ cupreous reflections on the sides. Caudal pale olive. All the other fins nearly colorless.

Length. 3 feet.

Vernacular name "A-va-o-pa"

Habitat. Society Isls.

Remarks.—The drawing and description are from two examples 9 inches long.

Megalops cyprinoides

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Channel Inc 237

B. 5; D. 1/12; A. 1/8; T. 11; P. 10; C. 7, 1, 10, 7, 1, 8.

The general aspect of this species is rather stout, both in depth and breadth. The dorsal commences at a little greater distance from the snout than the length of the caudal fin. The greatest depth of the body, which is beneath the origin of the dorsal fin, equals two-ninths of the total length. The head comprised about a fourth of the fish, caudal excluded. The eyes are rather large, sub-circular, their greatest diameter entering four times in the length of the head, and once in a space and a third in that of the snout. The snout projects a little in front of the lower jaw. The hinder lip of the maxillary reaches a little posterior to the vertical, which is obtusely rounded, longer than high, sub-graduate, and exhibits a rounded corner. Interspinal membranes, united to the sub-opercle just beneath the corner of the preopercle. Upper margin slightly arched downward and forward. 27 longitudinal rows of scales may be counted between the dorsal and ventral fins, 12 above and fourteen below the lateral line.

The dorsal fin commences a little nearer to the base of the caudal than the end of the snout; it is sub-triangular in shape, pointed above, and the upper margin is long, oblique and concave. Its height exceeds the length of base.

The anal fin is small, elevation

the lower margin. The pectoral are inserted at a point beneath the shoulder belt of the dorsal bone, or a little nearer the head than the base of the caudal; when closed, depressed to the body, do not reach the anal fin by one third its own length. The pectorals which are attached on a horizontal line with the sub-opercle extend half way to the ventral. The caudal is deeply forked, the lobes acute.

Color brilliant silvery, the dorsal region blue and the top of the head olivaceous green. Sides silvery. Fins more or less tinged with olivey.

Length 3 feet.

Hab.—Secretary Isl.

Native name Ara. The drawing and description is from a specimen 18 inches long.

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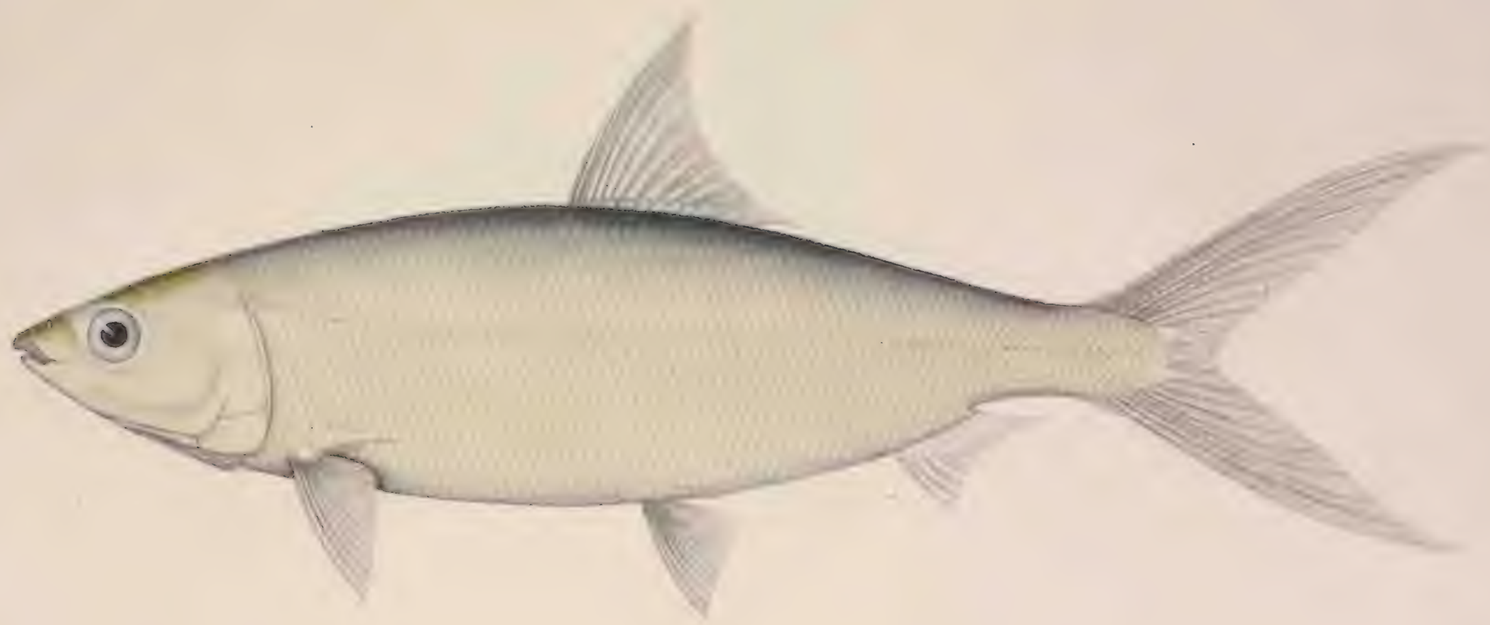

Chanos chanos

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Anguilla marmorata, Quoy & Gaim

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This *Anguilla* is sub-cylindrical, but becomes much compressed posteriorly. The vent is just in advance of the middle of the total length. The head, which is much shorter on its top and sides, is about one-sixth of the total length, measuring to the gill apertures. The snout is long and the jaws even. Both lips are in a single, closely set band in either jaw, cord-like, the external ones scarcely tapering and have truncate, truncate tips. Slender acute recurved teeth on the vomer and a narrow one on the palatine bone. Eyes oval, rather large, their upper limbs closely approximating to the upper line of the head, and distant about once their greatest diameter in advance of the hinder angle of the mouth, which latter extends one-third of the distance to the gill fissures. The snout as seen from above is rounded in front. The tongue is scarcely bounded. The depth of the body taken at the vent, is comprised about fifteen times in the total length.

Both dorsal and anal are mod-

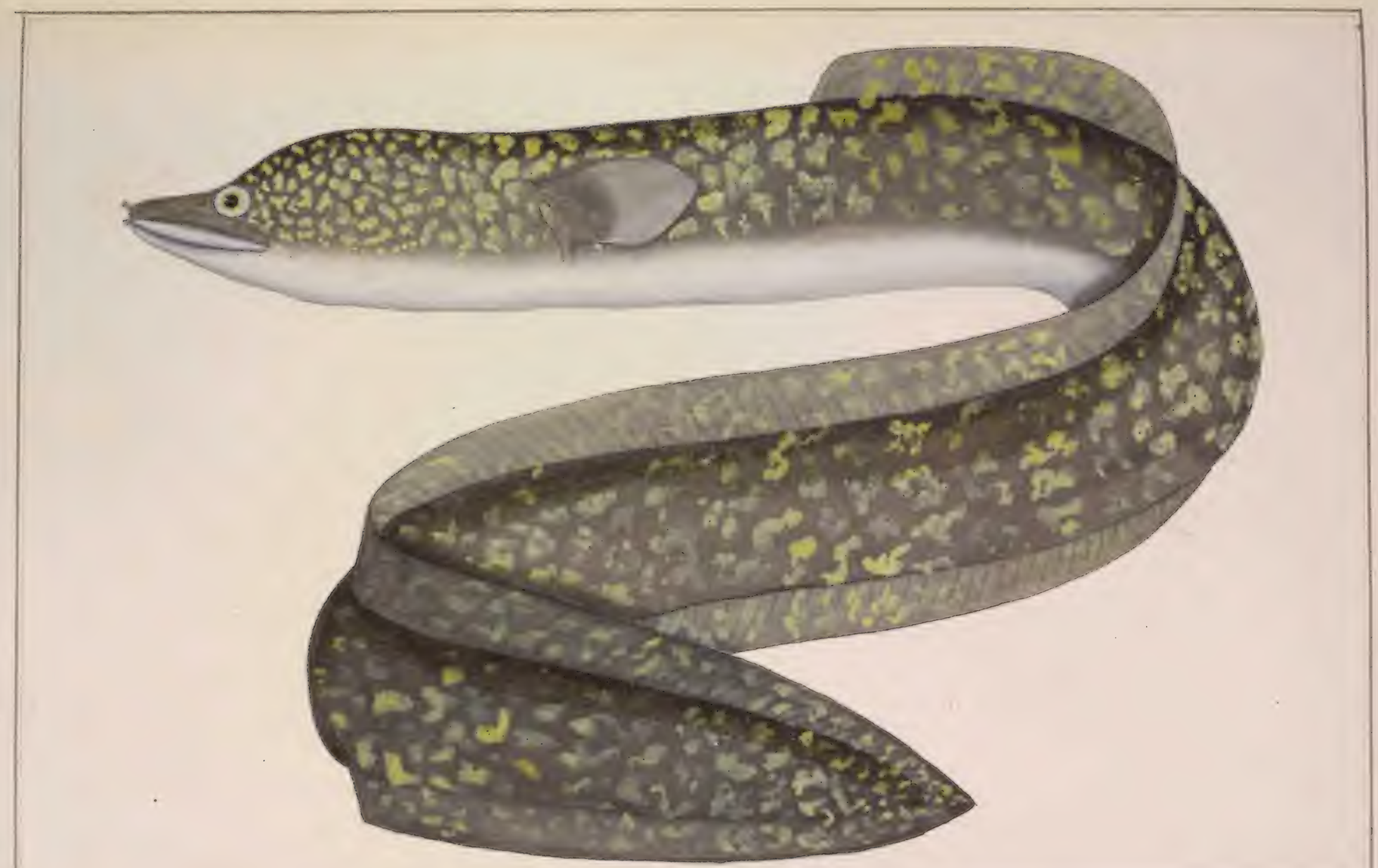
entirely adnate, ending in a point at the end of the tail, and the former commencing at a point just over the length of the head in advance of the latter fin. The pectorals are large, oval, their tips reaching half the distance from their base to the origin of the dorsal.

Color brownish-slate; belly and lower part of the head dirty-gray. Everywhere, except the muzzle, lower part of head and belly, marked with rather close irregular greenish-yellow spots, which are very small on the head. Sides pale bluish, with a narrow golden line near the corner.

Length, 3 to 4 feet.

Habitat.—Society Isls.

Remarks.—A fresh water species, but less abundant than the *A. microdiscus*, from the same location. The drawing and description are from a specimen 21 inches in length. This species differs from the true *anguilla* in the dorsal fin extending much further toward the head, its even edge, and having palatine teeth.



Anguilla

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Anguilla microcephala, Gunth.

The depth of the body taken at the vent enters nearly fifteen times in the total length. The vent is exactly midway between the gill openings and the tip of the snout. The head is small, constituting an eighth of the fish, and is flattened above; its sides are nearly parallel from the gill openings to the eyes. The muzzle is arched from side to side and very short. The gape of the mouth is small, not extending posterior to the eyes, and is thus oblique in its direction. The eyes are large, circular in shape, their diameter entering nearly nine times in the length of the head, measuring to the gill fissures. The distance from the tip of the upper jaw to the eyes is a little more than the diameter of those organs. The interorbital space is twice the diameter of the eyes in width. The mouth is closely set, minute cards to the teeth in either jaw are seen.

The dorsal and anal fins are moderately developed, the former commencing about the depth of the body in advance of the latter, and both terminating

is an obliquely rounded tail. The pectorals are rather large, truncately rounded and composed of sixteen or seventeen rays.

Color blackish-brown along the dorsal region; sides light bronze, and the belly silvery-white. Anterior nasal tubes, orange. Irides silvery. Lectums dark blue-black, and bronze on the basal third. The dorsal is brown, becoming black posteriorly. Anal whitish anteriorly, passing at brown posteriorly, and black at the end of the tail.

Length, 20 inches.

Habitat: Society Is.

Remarks.—Only a solitary example of this species has come under my notice. It was taken in the fresh water streams of Huahine island of the above group. It compared with N. ater-olivacea, it differs in color, has a much smaller head, larger eye and shorter snout. The gape of the mouth is not nearly so cleft as in that species, the head is flattened and the tail more rounded.

Anguilla

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Anguilla atro-olivacea, Jord.

The snout, measuring to the gill openings, enters about seven times in the total length. The upper line of profile from the end of the snout to the occipital region is deeply concave. The gape of the mouth extends considerably behind the eyes. Teeth fine, crowded, card-like, disposed in a band on either jaw and similar ones may be seen on the vomer. The eyes are circular. The depth of the body at the region of the vent is contained in the entire length of the fish nine to seventeen. The vent is nearer to the end of the snout than to the end of the tail.

The dorsal and anal fin are well developed, rounded off at the tip of the tail, and the former takes its origin twice the length of the head posterior to the gill apertures.

Color dusky-olivaceous, passing into cinereous white beneath, and white on the belly. Sometimes darker botelike blotches may be observed along the dorsal region, anterior nasal tubes,

orange. Sides blueish-lead color; cornea blue-black. Pectorals slate color, becoming dotted yellow posteriorly

Length,— 2 to 2 feet.

Habitat:— Society Isls.

Remarks:— A common species in all the fresh water streams and ponds throughout the above group of islands, where it is called "pu-hi" Its flesh is excellent.

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Anguilla

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Longer marginatus, Val.

Longer marginatus, Val.
= = Lyd. et Soul., Voy.
Bonite, vol. 1, p. 201, pl. 9. fig. 1.

Two immature specimens now before me, measuring 15 and 16 inches in length, are quite slender, being cylindrical anteriorly, but gradually become more and more compressed towards the tail. The depth at the origin of the anal fin is about one-eighteenth of the total length. The distance from the end of the snout to the vent is only about one-third of the total length. The head is small, elongate-conic, flattened above, and compressed two-nineteenth of the fish. The snout is rounded off. The gape of the mouth is deep, nearly horizontal and extending a little behind the eye. The teeth, which are closely set, acute and recurved, are disposed in a single row on either jaw, and similar ones on the vomer. The moderately large eyes are sub-circular, and separated by a space equal to their own diameter. The posterior nostril is close to the eye.

The lateral line starts from the eye. Branchiostegal rays nine. The dorsal and anal fin are quite deep, the former commencing a little posterior to the base of the pectorals, which latter are small.

Color, chocolate-brown, passing into bluish silver beneath. A small black streak runs parallel and contiguous to the upper lip. Irides pinky silver, with a golden circle near the cornea. Pectorals colorless. The dorsal and anal are also nearly colorless, both margined conspicuously with black, and an intramarginal white line.

Length, 4 to 5 feet.

Habitat— Sandwich Isls.—Society Isls.

Remarks.— This tunny may be distinguished by its black marginal fins. At the Society Islands it is called "Li-to". Its flesh is excellent. The figure in the Zoological plates of the Voyage of the Bonita is too highly colored.

Conger marginatus

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genus Conger, Cuvier.

In these fishes the upper jaw is longer than the lower. Teeth fine, canine-like, disposed in one or three rows, and similar ones on the vomer. Pectorals small. The dorsal commences near to the gill orifices.

Conger ~~macrocephalus, Gronn.~~ Cowperii

The body of this remarkable species is sub-pellucid. The depth between the origin of the anal fin is one fifteenth of the total length and the thickness at the same region is two-thirds the above mentioned depth. The lateral line starts from a point midway between the eye and pectoral base. The head is rather large, comprising about one-sixth of the entire length, and terminates in a rather long conical snout. Teeth in both jaws disposed in bands, which are fine and canine-like. The posterior nostril is situated midway between the eye and the end of the snout. Eyes very large, sub-circular, even with the upper line of profile, and their diameter is nearly a fourth of the length of the head. The gape of the

mouth extends back as far as the centre of the eye. The dorsal fin, whose depth equals one-third the height of the body, starts from a point immediately over the gill aperture, which latter are large. The anal commences nearer to the head than the end of the tail. The pectoral fins are rather pointed and composed of 13 or 14 rays.

Body nearly colorless, which in certain light reflects brilliant silvery. A light blue line follows the posterior half of the lateral line. Iris, above, pectoral brownish bars on the head, one behind the eye, one passing through that organ and the fourth at the end of the snout; a profusion of microscopical yellow points beneath the head and belly gives these parts a tinge of that color. Fins brownish & fins transparent; the dorsal and anal with a narrow blackish margin.

Length, 10 inches.

Habitat.—Sandwich Isls.

Remarks.—I have seen three specimens of this curious species. They are called "Pa-li-uu" by the natives.

Congromuraena Kaupii
Sauvage fil.

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Opisthognathus aporus
garretti

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Family Sparidæ No 427

Skin singular and in a cylindrical shape, very slender, and becoming slightly compressed posteriorly, where the tail ends in a rudder-like point. The depth at the vent equals one-twenty sixth of the total length. The head, which comprises one-tenth of the fish—measuring to the gill aperture—is small, and the snout is conical. The eye is large, longitudinally oval, and the small cornea is elliptical in shape. The jaws are even and the nostrils are pierced through little fleshy tubes. The pectorals are rudimentary, and the dorsal and analare well developed, both terminating a little in advance of the tail.

Color gray, grayish white beneath, and decorated with large brown saddle-shaped spots. Interspaces between the spots tinged light brown. Head closely maculated with irregular shaped brown yellow spots, which shaded off with brown. On the top of the ~~head~~ the spots are small and of a dark-color. Fins brown. Skin sub-transparent.

Length 23 inches.

Hab. — Society Isls.

Very rare. Lives in sand.

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Coluber sp. garretti

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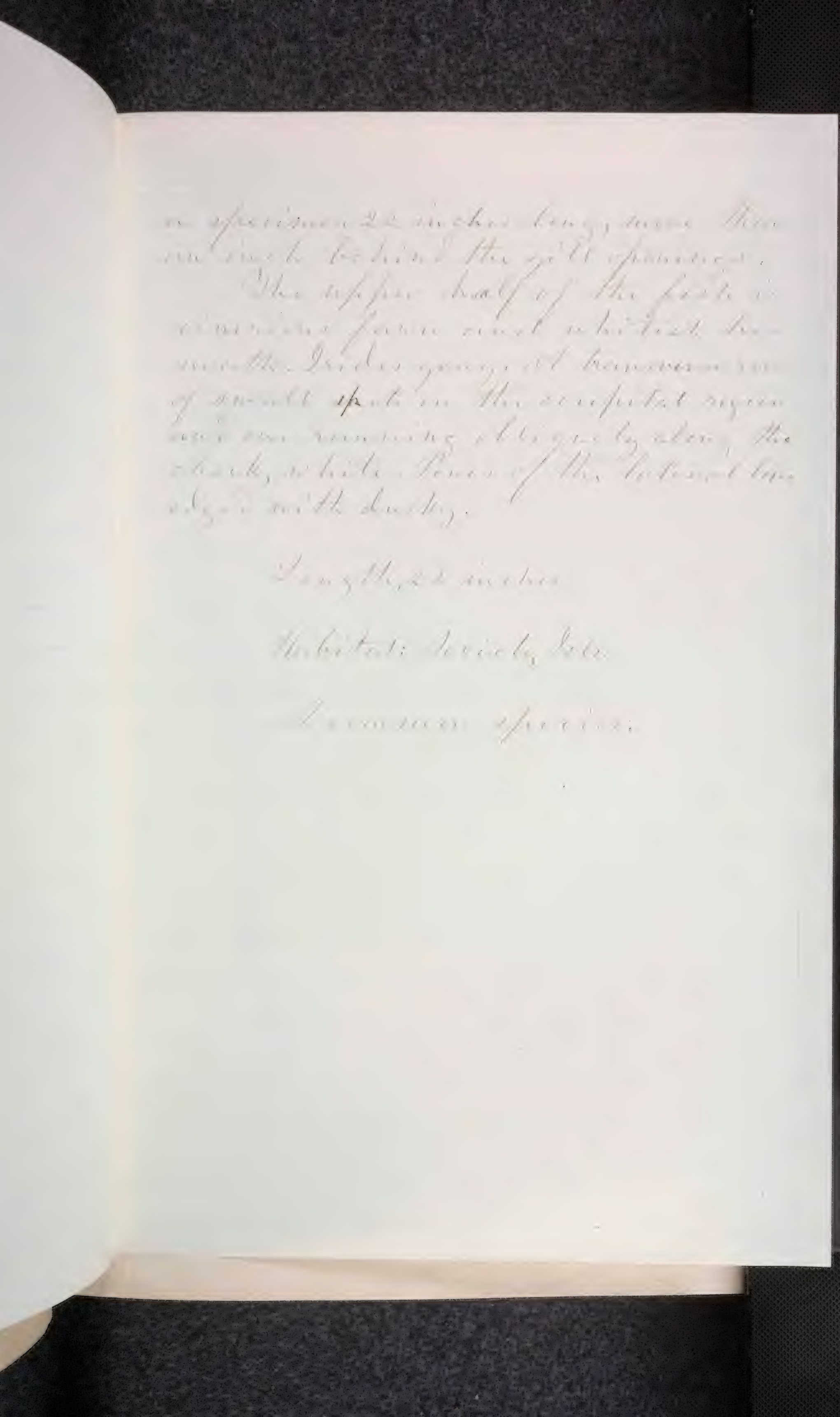
? Ophichthys crocodilinus

The depth of the body at the anus, is less than twenty times in the total length, and the length of the head, as compared to the whole fish is as three to twenty two. The snout is a little shorter than the middle of the total length. The lower jaw is a little the longer, and is armed with two small anterior canine teeth, followed by one much longer, and a long serrated space with the remaining teeth on the remainder half of the jaw. The upper jaw is furnished with a similar range of short slender, recurved teeth, which are smaller and closer behind, and fang like teeth may be seen distinctly exposed on the exterior. Traces of short teeth exist on the tongue. The eyes are very small, and subcutaneous, [illegible] The upper caudal fin [illegible] of the second fore teeth a part [illegible] of the [illegible] extent of the [illegible] is [illegible] by about half [illegible] the general [illegible]
The dorsal fin commences [illegible]



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? Ophichthys crocodilinus

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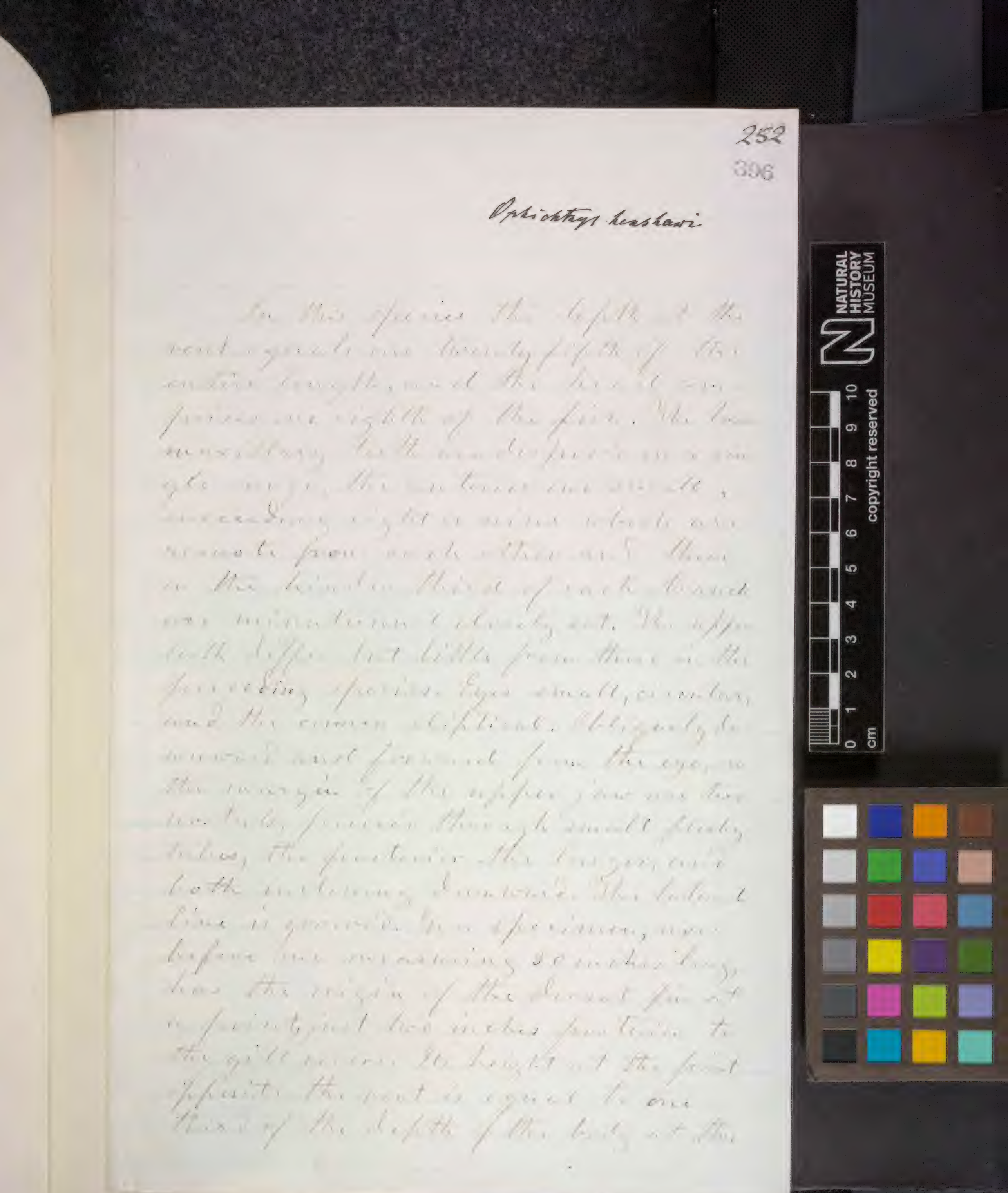
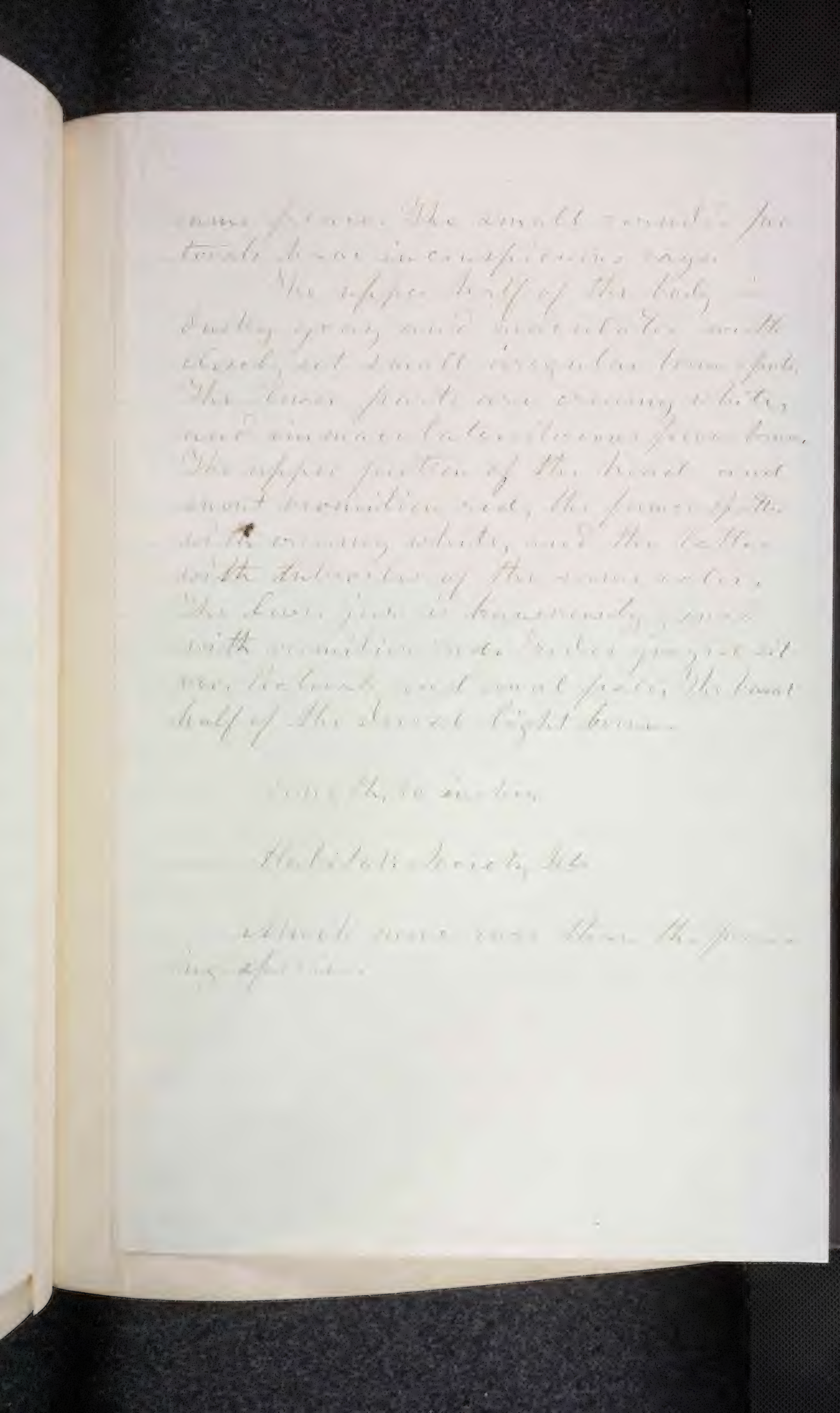
Ophichthys kraskari





Gen. char.

Body cylindrical, elongate, slender. Head very large, shorter than, and strongly inflated in the region of the throat. Branchial orifice consisting of a vertical fissure just in advance of the base of the fore-legs. Sternum tapering, becoming abruptly contracted just behind the legs, which latter are small, and situated near the end of the sternum. Mouth deeply cleft. Mandible teeth and canines or fangs as the maxillipeds, rather short and stout, hooked with a basal groove. The posterior eyes some distance from the head and both beneath overhanging just before reach-

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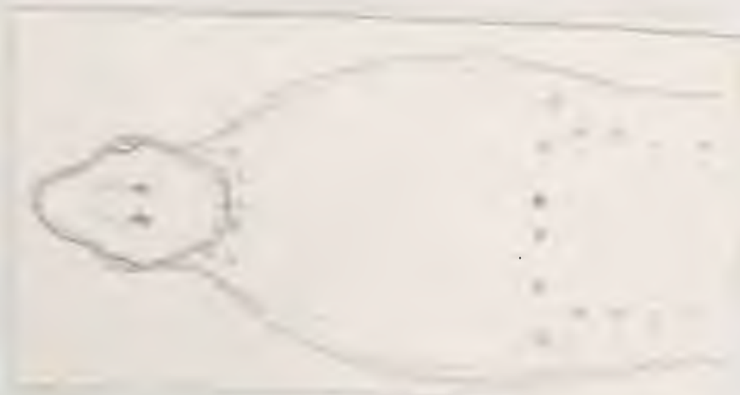
These fishes may be distinguished from their congeners by the presence of three-cusped teeth, by their large head, eyeball and bodies and the absence from the cheek of the characteristic pores of the genus. The peculiar outline of the throat, the large mouth, open gills and the eyes on the side near the end of the throat are all characters not existing in that genus. They also differ from Cephalopholis in their slender bodies, longer fins, more small scales and shape of the mouth.

Their habits are the same as the fishes mentioned. They have gizzards and are called by the natives "Hou-me"; literally, sand eater. They construct little hillocks of sand, plants and, when disturbed it is really surprising to witness the rapidity with which they will retreat beneath the same.



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Ophichthys kenshawi

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Ophisurus alternans, colubrinus Lacep. et Quoy.

Ophisurus alternans, Lacep. et Quoy. Zool. Voy. Freycin., p. 213, pl. 45, fig. 2.

Form very much elongated, slender, and but slightly compressed. The vent is slightly in advance of the middle of the total length, and the depth of the body at that point is, as compared to the entire length of the fish, one to fifty four. The head, according to the gill openings, enters nineteen or twenty times in the total length. The gape of the mouth extends a short distance behind the eyes, which latter are small and circular in shape. The dorsal and anal fins are well developed, the former commencing in advance of the gill openings and extends farther back than the latter fin.

Color creamy-white, slightly shaded with light brown, and girdled with twenty-five or thirty deep snuff brown bands which are slightly contracted on the flanks and ascending the fins. The two anterior ones on the head do not reach the lower line of profile. Some-

times the interspaces between the bands are decorated with minute digital, and irregular dispersed circular spots of the same color as the bands.

Length, 2 feet.

Habitat.— Society and Kingsmill Isls. Vernacular name at the former location "Auau", and at the latter "Teimane".

Remark.— The specimen figured by Lucy and Spinnard was procured at Apaiang and their palate shows thirty-two bands.

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Ophicthys colubrinus

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Ophisurus ~~serpentinus, Gardt.~~ maculosus

Of this species I can give but an imperfect description as the only specimen which I obtained, passed out of my possession before I could note down any of its specific characters except color. The head is much smaller than, and the snout is shorter than in the preceding two species. The pectorals are very small.

Color pale straw-yellow, and white beneath the head and belly. Three rows of large round dark brown spots, arranged alternately, extend from the head to the tip of the tail, a few similar colored spots on the head.

Length, 15 inches.

Habitat - Sandwich Isls.

Remark. - At the above location this species is called "Puhi la-au".

Ophichthys maculosus

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Ophichthys macrodon 399

Cephalostylus arenicolus, Garrett

"This remarkable eel is very much elongated, slender, cylindrical, becoming slightly compressed posteriorly. The depth and thickness at the vent are equal, or about one-third the length of the head, which latter enters nine times and a half in the total length. The vent is about midway between the gill orifices and the end of the tail. The snout is very slender. Eyes small, circular, situated exactly midway between the end of the snout and the hinder corner of the mouth. The anterior nostril is large, ambulate.

Color sandy gray, paler beneath. Irides pale golden yellow. Tail tipped with pale red. Fins colorless.

Length, 10 inches.

Habitat: Socorro Isls.

A very rare species, of which I obtained a single example.

Genus *Cephalostylus*, Barnett.

Form elongate, slender, subcylindrical. Head tapering to a point; mouth abruptly contracted on the sides. Upper jaw projecting considerably in advance of the lower. The two nasal orifices approximating on the margin of the upper lip, opposite the end of the lower jaw; the hinder one which is on the inner edge of the lip is overlapped by a small fimbriated tentacle. Teeth (?). Cheek swollen. Branchial apertures large, approximating on the sides of the throat. Pectorals none. Dorsal and anal but slightly developed, the former commencing a short distance posterior to the gill openings, and both terminate before reaching the end of the tail, which latter is pointed. Both fins can be folded back into a basal groove. Lateral line distinct, consisting of a median row of pores.

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Opisthopus macrodon

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Rhodes No 407 Ophichthys macrops

We obtained a single specimen of this singular eel at the Kidzgemilt Isls. The drawing is of the natural size. Color of a uniform blueish gray, with colorless fins, which are margined with a narrow black. Sides yellowish with a black oval ring encircling the small cornea. A row of black dots along the lower jaw, a row on the upper one and two in front of the eyes. Having misplaced many notes I cannot give any details description. It lives in the sand. Its tail terminates in a rigid point like other sand eels and the body is nearly cylindrical.

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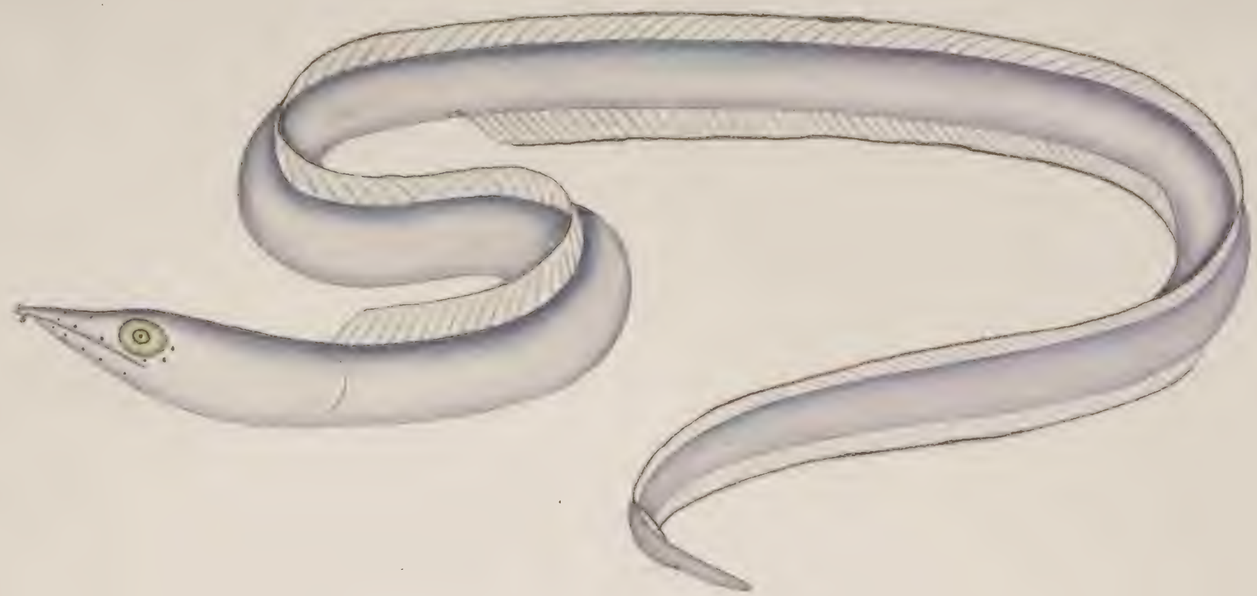

Ophichthys macrops

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gen. Ophisurus, Lacep.

These eels are more slender than the Muraenidae or Congers. Their feet are but little compressed and their tails terminate like a punch, being destitute of a fin. The head is more or less long, and terminates into a pointed snout. The upper jaw is much the longest. Teeth small, pointed and recurved. Eyes small. Anterior nostrils pierced through little tubes and placed near the lip of the upper jaw. Gill orifices small, situated a little beneath the median line. The dorsal and anal are well developed, the former extending the whole length of the body, and, together with the latter terminates before reaching the end of the tail. The intestines are similar to the true eels, but extend on to the base of the tail beyond the anus. In some species their is no pectorals, others have very small ones.

Ophisurus serpentinus, Garrett.

The greatest depth of the body enters
twenty one times in the total length. The
snout is a little nearer to the tip of the
tail than to the end of the snout. The
head, which is rostriform, comprises two-
twenty ninths of the entire length. The small
eyes are situated twice the diameter of
their orbits from the tip of the snout. The
dorsal commences just behind the gill orifice.
The pectorals are very small.

Color pale whitish-straw yellow above
and bluish-white beneath. The upper part
of the head is light yellow, and the tip of
the snout and end of tail, reddish. Sides
ornamented with a row of twenty, six or seven
very large deep brown saddle shaped spots,
which are much wider than their interspaces;
these spots, beneath the dorsal fin are con-
tinued upwards to its upper margin, but
paler than the maculations themselves.

Length, 19 inches.

Habitat.— Sandwich Isls.

Remarks.— A single specimen (Leuco,
which had 26 spots on one side and 27 on the
opposite.

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Ophichthys

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Mastigias ~~abbreviata~~ coeicis

Nudes No 245

This remarkable eel was like No 240 dug out of the mud at a depth of two or three feet. The natives and the foreigners told me that they live in such stations. The integuments covers the mouth eyes so that the jaw is not visible until the skin is cut away from the orgin. Vision must be very imperfect if not entirely wanting.

The specimen before me measures 19¼ inches, and is very slender, cylindrical, becoming compressed towards the tail. The greatest depth of the body is but 4¾ times in the total length. The mouth is on the posterior part of the middle third of the total length. The head, measuring to the gill openings, is contained in the entire length ~~of~~ two to twenty-four. The mouth is pointed, the gape of the mouth ^small extending back nearly to the distance to the gill aperture. Both the and nostrils the same as in No 244 but the former less developed. The eyes are very small

The fins are all undeveloped, the dorsal and anal only exhibiting rays near the tail where they unite.

Color blackish brown above becoming pale brown beneath the head and body. The lower part of the head tinged with red and four reticulated veins of the same color on the abdominal region. Pectorals red.

Hab— Society Isls.
Native name Paraoffoa

? Ironinqua microchir

Species No 246

We have before us a single specimen of this fish, measuring 9 inches in length. It was found in 3½ fathoms of water on a depth of one foot beneath the surface. The natives assured me that they live in such stations and call them mud-eels.

The upper parts are of a blackish brown hue passing into coppery silver beneath, which is also beautifully variegated with fine red veins. The caudal is tinged with flesh red, and the fins have a bright red shade dark brown color. The dorsal and anal colourless.

The general aspect is elongated cylindrical, fully as broad as deep, but becoming compressed towards the tail. The greatest depth as compared to the total length is as one-to-twenty eight. The mouth is much posterior to the middle of the total length. The head, according to the specimen, enters eight and 2 one-third in the entire length. The gape of the mouth is moderate, equal to about one-fifth the length of the head. Teeth are in a single series, short stout and slightly hooked. The eyes seem to be covered by the integuments. The posterior nostrils are large, open, bare, and situated just in front of the eye, with an opening and one tubular and fringed near the end of the snout. Lateral line distinct. The jaws are even and the mouth is stout and obtuse.

The pectorals are rudimentary.

The small dorsal fin commences behind the anal; it extends over a base less than the length of the head, arched in shape, the rays simple the middle ones the longest and gradually shorter towards the head and the rounded hinder one. The small fins are in which form a slight ridge. The caudal is well developed, four-sheafed, convex behind and the rays numerous. The anal fin, which is sheafed like the dorsal, takes its origin under the first, and though longer than the latter does not reach so far posteriorly.

Nat. Society Feb.

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246

Boiga dendrophila

Boiga drapiezii

1. Boiga dendrophila

2. Boiga drapiezii

Apodes No 133

Not having made any notes at the time I obtained the specimen I cannot give any description —— The drawing is natural size of the single specimen obtained at the Society Isds. At the Viti Islands I saw an example 3 feet in length. They burrow in the sand.

Moringua

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Genus Colubrinichthys, Garrett

This genus has the general characters of Ophisoma, but may be distinguished at first sight by having its tubular nostrils, of which, as in Ophisoma, the anterior is furnished with a short tentacle, from every thing else, including Ophisoma itself, by the remarkable position of the eyes.

Colubrinichthys Muraenaparadalis ~~speculiris~~, Garrett.

This remarkable species is considerably compressed, and the height is very great. The depth of the body at the vent enters about fourteen times in the total length. The head comprises two fifteenth of the fish. The snout is a little nearer the tip of the tail than the end of the mouth. The muzzle is long and tapering, the jaws slightly arched, so that when the mouth is closed their middle lateral portions do not come in contact. The gape of the mouth extends a little more than half the distance to the gill openings. The circular eyes are quite large and located rather near

the hinder corner of the mouth than the end of the snout. The posterior nasal tentacles are twice the length of the anterior pair. Maxillary teeth subulate, acute, disposed in a single row, with minute ones between the larger. The fins are well developed, particularly the dorsal, which commences on the occipital region, and terminates into a lance-pointed tail.

Color rich brown, becoming darker posteriorly, and a fine yellow on the lower parts anterior of the vent. Everywhere on the brown ground profusely sprinkled with whitish and black, small roundish spots which more or less coalesce. Posteriorly the maculations are oblong, vertical and the two colors unite. Throat and belly marked with large pale spots, which are margined with pale brown color, and the lower jaw is transversely zoned with the same color. The upper jaw is reticulated with yellowish brown, and marked with darker colored dots. Tentacles vermilion red. Irides livid.

Length, 23 inches.

Habitat: Society Isles.

Its vernacular name is "Pe-tea"

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165

Muraena vardalis

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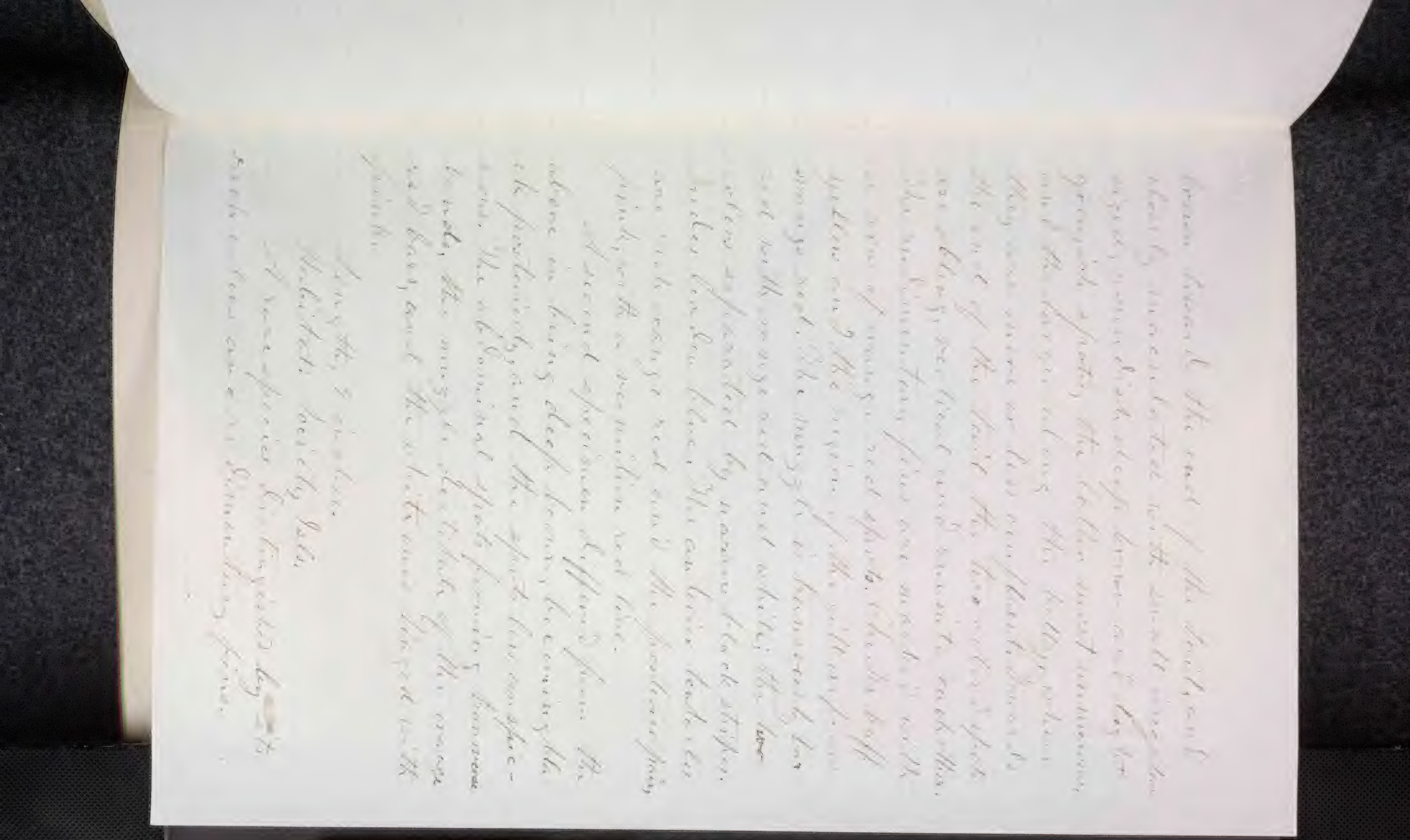
255
406

Muræna pardalis
Cuv. Cuvieri. Ich. Rhys ~~elegans, Gmel.~~

This elegant species has the jaws
rather lengthened, the front of snout
somewhat depressed in the last
skin. The depth of the body at the vent,
is not contained in the total length, five
to six times. The head, measured
at right angles to the gill openings, contains
one-seventh of the fish. The snout is obtuse
to the front than the end of the head,
which latter is pointed. The eye, is
of large size and the space between the eyes is deep
and flat. The jaws are in the proportion of seven
to eight, and the upper jaw is armed
with two rows of formidable teeth, and inter-
nally four, also a double row on the vomer.
Outer row of each jaw, the anterior teeth



Muræna pardalis

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Uranacra meleagris Forster, Smith.

This singular species forms a character, which will probably prove it to be removed in a future division from Uranacra. The gill orifices are a long horizontal slit, and the deep basal compressed portion. The depth of the body immediately over the pect is one-sixteenth of the total length of the fish. The mouth is a little in advance of the middle of the entire length. The head, which is not shelling, enters eight and a half times in the total length. The muzzle is long, blunt and tapering. The eyes are circular and situated nearer to the end of the snout than to the hinder angle of the mouth, which latter has a deep pit extending half the distance from the end of the muzzle to the gill fissure. The teeth which are conical-shaped on both jaws are disposed on a single row on the edges, of which those in the anterior half are the longest and more remote from each other, than the posterior.

ovate. On the dorsal half of the first joint there exists a second very extensive range similar to those below, slightly recurved forwards to the eyes, and in front of them rayless they are longer and more acute. The end of the jaw is armed with several chitinous or fang-like rings of the tuberculous teeth external back from the corner. The second joint is large, and somewhat curved the further corner of the mouth. The antenna is comparatively very long, and the end of the stem is acutely rounded. Colour pink uniform brown, most profusely irregularly the carapace here with small round white spots. Rather abdo becoming golden towards the corners.

Length, 22 inches.

Habitat: Society Isls.

I have seen but a single specimen of this rare ext. St. peculiar markings, large ovate gill openings and long dorsal row of obvious characters.

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Muræna meleagris

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Muraena Pearsii, Garrett.

The head constitutes about one seventh of the entire length, and is slightly tumid in the occipital region. The snout is rather long and tapering. The mouth exhibits a deep gape which extends more than one-third of the distance between the end of the snout and the gill orifices. The small circular eyes are a little nearer to the end of the snout than the tip of the snout. The depth of the body at the origin of the anal enters about thirteen times in the total length. The lower mandibular teeth are small, acute, recurved and disposed on a single row. Those on the upper jaw are arranged in two rows, the external ones dissimilar to those below, and the others are subulate, longer, and scarcely recurved. The end of the inferior jaw is furnished with several fangs, and the snout is furnished with a row of about fifteen stout conical

Teeth. The fins are of moderate size, the dorsal commencing in the poste-rial region about midway between the hinder angle of the mouth and the gill orifices.

Color purplish brown, with ir-regular pale freckles, and more or less confluent, emarginated dark purple brown spots, which are larger on the posterior half, where they assume longitudinal forms, and become smaller and smaller anteriorly, until they finally disappear on the head. Sides mammelated with steel blue, reddish and yellow. Some individuals are black purple brown and the spots are nearly obsolete.

Length, about 12 inches.

Habitat: Society Isls.

This species is somewhat com-

Muraena nebagis

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Hirudo rouxii, Gmelin.

This Hirudo is of a rather slender aspect, the width of the body at the commencement of the anus 6 lines, or four-tenths of an inch, being as the total length. The mouth is a little beyond the end of the first fifth of the whole length of the animal. The lower lip is slightly longer, as compared to the entire disk, than in *H. medicinalis*. The jaw-muscle is rather short and broad. The small circular eyes are situated a little nearer the end of the snout than the hinder margin of the mouth. The jaws are strong and the space of the mouth penetrates about nearly half the length of the head. The superior teeth are moderately numerous, acute, slightly recurved and disposed in a single row on each jaw. The inferior ones are quite regular, the intervening part being a little concave, and longer than the others. The inferior maxillary teeth are more numerous and shorter than in the preceding species.

is well developed, consisting of the stems of the gill rakers and branches into the finer soft tufts.

Outer front chocolate brown, the margin darker, most conspicuously marked with numerous irregular blackish brown spots. The spots are mostly sub-marginal, disposed in three rows, the anterior one continuous, the posterior the broad, white shaft on the belly and very irregular both in size and arrangement, and usually one of the largest spots on each fin, except in the pectoral, where the largest is the anterior marginal white spot.

Length, 10 inches.

Habitat: Brighton.

This fish and the succeeding were at the above locality where it is called "Cuckoo". It frequents the same waters with the Mackerel, shifting with it from one of the fishing stations to the other.

? Muraena meleagris

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1. Mustelus undulata, var.

This species is of a dusky gray color. The head with a pointed snout, and the lower jaw brown. Body slender. Everywhere except the ventral surface and along the belly, rather profusely maculated with irregular sharp brown spots, small and remote on the head, and a row of large ones along the base of the anal fin. Those on the dorsal are mostly oblong and oblique.

The compression of the body is stronger than usual, and the snout is in advance of the middle of the entire length of the fish. The depth of the body, taken at the origin of the anal fin, is as compared to the whole length, nine to twenty two. The head is arched above, and comprises two fifteenth of the total length. The muzzle is long, conical and rounded off at the end. The eyes are larger than usual, suboval in shape, their upper limb even with the upper profile. They are seated just mid-way between the end of the snout and

the hinder angle of the mouth.
The teeth are rather large, curved,
pointed, disposed in a single row
in either jaw, the anterior ones project-
ing into fangs, with similar ones
in the inner. The pharyngeal bones are
rather large, and continuous
uninterrupted between the hinder angle
of the mouth and the gill openings.
The anal of the male is forcipated.

Length from nose to three feet.

Habitat: Socially Sols.

The drawing and description
are from a specimen 23 inches long.
It is remarkable for its long muzzle,
large eyes, conspicuous dark bars
and black border to the pectorals
become in the Socially Sols, as in Pisc
Description.

Taf. 165.

Muraena undulata, var.

undulata, var. 262

Muraena Valenciennesii, Gthr.

Muraena Valenciennesii, Sy. A. Duméril,
Dendr. Ichth. p. 207,
pl. 6, fig. 1.

one of
shape, and distant about twelve
between the end of the snout and the
posterior angle of the mouth. The low-
er maxillary teeth are acute, compress-
ed recurved, disposed in a single row,
and do closely set as to present an
uninterrupted cutting edge, along the fron-
tal part of the jaw. The superior maxillary
teeth are somewhat irregularly dis-
posed and have canines intermix-
ed. The anterior part of the lower
jaw is armed with external incisor-
shaped canines. The tail is pointed.
The vent is a little nearer the end of
the tail than the tip of the snout.
The fins are well developed, the
dorsal commencing on the occipital
region.

Olive brown, paler along the
belly and becoming chocolate brown
on the margin. Every where except

The wings are dull bluish, beautifully marbled and reticulated with whitish yellow. The marbling is disposed to assume vertical markings on the posterior portion, hidden in upper view.

Said to attain a length of 5 – 6 feet.

Habitat: Society Isls, Paumotu Isls. Sandwich Isls. Kingsmill Isls.

This Albatross, which is the largest species inhabiting the Polynesian seas, is much famed by the natives. While interesting at the Paumotu Isls, I saw a native who had just been attacked by a large cat, which from this description of the monster should have been this species. He said it was a large one his thigh, and if others assistance had not come to his assistance he would have been killed. One of his legs was dreadfully lacerated, showing marks of claws. He was in the town and I looked at it. It had been sketched with an expedition drawing and description was taken from a specimen in the shop.

Taf. 165

Muraena undulata, var.

(Gesellschafts Inseln.)

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undulata
(margaritophorus, Blkr)

Mycteroperca [illegible]

This species, of which a number of specimens were obtained, is of a light brown color which fades into a bluish gray beneath the head and throat. The body and head are more or less conspicuously mottled with small dark yellow irregular shaped spots. The dark brown irregular stripes extend forward from the eyes, the lower one about and the upper one more or less broken up and forming dark on the yellow spots. Sides yellowish-brown.

The depth at the root of the tail enters one-fifth or twenty times in the total length. The snout is much in advance of the middle of the eye. The lower jaw, which is slightly shorter, comprises more than a fourth of the entire length, and the length of the head is contained three times. The small round eyes are scarcely wider than the interorbital space, a little more than their own diameter apart. The opening of the mouth is oblique, and the upper jaw extends to a point beneath the middle of the eye. The yellow surfaces of the cheeks, opercles, and throat are marked with numerous round dark brown spots, disposed in irregular [illegible]

either jaw; teeth with several small points
and strong flat transverse ridges on the inner
side; the outer side of the teeth rough
from the effects of small teeth between
ears and pinnae in a single row. Pinnae
are moderate, triangular, both tomia
meeting only in a pointed knot.

Length, 8 inches.

Habitat: Locality lost.

Found under loose stone in the
garden; possibly specimen, first
mother long, had the spots longer than
in the one above described, and the
three longitudinal rows on the body.
The metatarsus and about staffs on
the head are good diagnostic characters.

Murænæ alladicii.

Apodes. No 258

We have seen about 20 examples of small eel the largest measuring four inches in total length. It is rather slender, sub-cylindrical, very slightly compressed, and gradually tapering away from the head. The depth at the vent enters about 19 times in the total length. The vent is slightly nearer to the tip of the tail than the end of the snout. No fins except a rudimentary caudal. The lateral line consists of a series of pores traversing the median line and takes its origin above and in advance of the gill apertures, and is preceded by two or three larger pores. The head which constitutes one-sixth of the fish, terminates in a short blunt rounded snout. The gill openings are on the lower third of the neck. The eye is exactly midway between the end of the snout and the hinder corner of the mouth. The gape of the mouth reaches about one-third of the distance to the gill orifices. Six pores may be observed on either side of the lower jaw, five along the upper and eight on the top of the snout. Teeth sharp, slender, card-like, of irregular size on either jaw. A single row of acute stout conical ones on the premaxillæ bone.

Color uniform light brown. Tail tipped with orange.

Hab.— Society Isls.

Common under stones at low water mark.

Sup
414

Muraena nigra, Gould

This small Muraena is uniform glossy black and the tail tipped with orange. Sides white. The head is about one-seventh of the fish, and the snout is rather stout. The lower jaw is a little longer than the upper, and the gape of the mouth extends nearly half the distance to the gill openings. The inferior mandibulary teeth are acute, slightly recurved, disposed in a single row and the symphysis is provided with several canines in front. The upper teeth which are of irregular size, are more slender than those below, disposed in a similar band and several anterior fangs. A single row of tuberculous teeth on the vomer, tapering behind, and situated in the middle of the palate. The snout is considerably in advance of the middle of the fish. The depth at the origin of the dorsal enters eighteen times in the total length. The dorsal starts from the occipital region and is of nearly equal height.

Length, 6 inches.

Habitat: Society Isls.

Muraena lugubris, Gmelin.

The small triangular aperture of a blackish brown color. The snout and lower part of the head dotted with, and perfusedly marbled with small clusters of blueish white dots. Eyes cupreous yellow. The back, which terminates into a rather long conical snout, comprises an eighth of the total length. The small round eyes are nearer to the hinder angle of the mouth than the end of the snout. The teeth are elongate, slender, unequal on either jaw and a pair of short ones in the center. The fins are nearly rudimentary.

Length, 2 inches.

Habitat: Society Isls.

A remarkable species from Huahine under Lance Stone at low water mark. Its distinguishing characters are the long snout, slender body, small fins and the peculiar clusters of whitish dots.

Muraena

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414

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413

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412

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415

Muraena

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Mimosa acuta, Gmelin.

Stem climbing, a little compressed, and beset with small hooked prickles. Leaves pinnate, with from eight to ten pairs of leaflets. The leaf-stalk is about an inch long, and is but little thicker. The eyes are circular and scarcely a little above the axil of the leaf. The footstalk of the flower is long, tapering, and the upper part is the longest. The calyx is very small, cleft almost to the base into five teeth. The petals are five in number, joined together for about half their length. The germen is oblong, and supports a slender style, which is about the length of the petals. The stigma is simple. The pod is about three inches long, and contains five or six seeds. The seeds are a little smaller than the end of the thumb nail.

The dorsal fin is well developed, and commences a little in front of the pectoral fin. The caudal is deeply forked.

Colour greyish, and strongly mottled with brown. Head brown. Iris with a ring of white spots. Inside of mouth yellow.

Length, 11 inches.

Habitat—Trinidad.

This species may be distinguished by its comparatively slender body, small mouth, delicate teeth, and the orbital ring of spots.

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417

Merluccius bivittatus, gen. n.

This species has the snout a little projecting beyond the mouth, the length of the head contained about three times in the length of the fish, and the length of the pectoral fin about one-fifth of the length of the fish. The first dorsal fin originates behind the level of the ventral fin, and the second dorsal fin behind the level of the anal fin. The caudal fin is slightly emarginate. The lateral line is nearly straight. The upper jaw extends to the level of the middle of the eye. The maxillary reaches to the level of the hinder margin of the eye. The teeth are in a single series in each jaw, and are slender, unequal, recurved, and not depressible. The vomer is armed with a single series of teeth. The palatines are armed with a band of villiform teeth. The tongue is free, and bears a patch of villiform teeth. The gill-rakers are long, slender, and numerous. The pseudobranchiæ are well developed. The air-bladder is large, and is divided into two chambers. The pyloric cæca are numerous, and are short and thick. The intestine forms a single loop. The peritoneum is black.

[illegible] yellowish yellow, the belly pale ochraceous, and every scale, except the nearly median ones, tipped with [illegible] with the exposed portion [illegible] The yellow color [illegible] from above downward, the pale ochraceous color [illegible] the [illegible] color on the [illegible] part of the body.

Length, 10 inches.

Habitat: Lewis's Isle.

The generic and [illegible] name of this species [illegible] "Ee-lee."

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416

Muraena

417

? Muraena richardsonii

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Uranoscopus fasciatus, Gmelin.

This small Uranoscope is 22 in. l.,
with four brown and marked transverse
parts after the vertical ones. Dark on the
the lips orange. It is more robust than
U. bifasciatus, and like that species the
snout is nearer the end of the mouth
than to the tip of the tail. The gill
openings are also lower down, and the
head which comprises one-seventh of
the entire length, is much broader in
the occipital region, and forms a more
obtuse angle. The eye is smaller and
nearer the hinder angle of the mouth.
The teeth are smaller, the lateral ones
terminal and of unequal size. The vomer-
ine teeth are the same as in U. bifasciatus,
and the fins like that species are
but slightly developed.

Length, 2 inches.

Habitat: Society Isls.

Found lurking under stones
at low water.

Narcaena ~~*acuminata*~~ *picta*

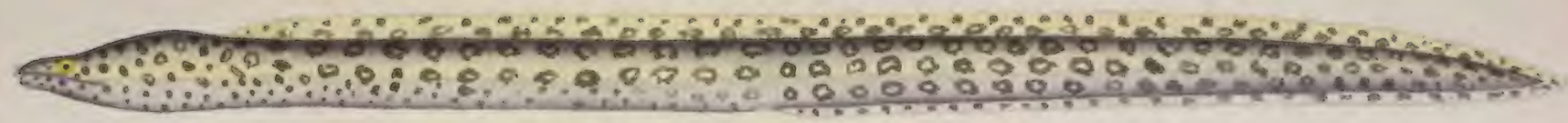
This species is more slender than usual. The cleft takes out the origin of the anal fin and is three times as long as the head is as long as the snout from the tip of the latter. The head corresponds nearly in length with the trunk, but slightly less, and the snout is long. The gape of the mouth is short, extending only a little beyond the distance to the gill opening. The inferior jaw is slightly the longer. The maxillary teeth are disposed in a single strong, sharp, recurved, those in the inferior jaw smaller, but increasing in size anteriorly where they may be observed when closed. The intermaxillary teeth are tuberculate, extending four teeth in a single row. The eyes are small, circular and inferior rather nearer to the corner of the mouth than the end of the snout. The first ray of the dorsal fin is opposite the gill opening, the dorsal commences above the gill openings. Scales lanceolate.

Color of the upper half fore wing yellow
fish color. The lower half fore wing
color. Fore wing veins marked with
small irregular blackish scales,
variable in size, and sometimes
absent. Longitudinal series of which
those coincide the basal, the two upper
continued along the body. The hind
wing belly maculated with small
irregular displaced full spots. A
series of fringe marks the base of the
elevated fin, and a row of small
full spots above and a dimly
series on the anal. Spider gathers.

Length, 6 inches.

Habitat: Society Isls.

The long angular and fringed
spots are the most obvious characters
of this species. The only example
in my possession has been mutilated.



Muraena viridis.

Muraena

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Murana picta

120

Muraena No 414

A single example of this species, now before me measures 12 inches in total length, and is perfect in structure. The head, measuring as usual from the end of the snout to the gill aperture, comprises two-fifteenth of the entire length. The snout is conical, and the gape of the mouth is nearly horizontal. The jaws are armed with a single range of rather stout, slightly recurved teeth, and similar ones may be observed on the vomer. The vent is nearly equidistant between the tip of the snout and the end of the tail.

The fins are moderately developed.

The color is creamy-white, ornamented with circular groups of purple-brown dots, the latter scattered on the belly and rather crowded on the head. Iris dusky gray.

Hab.— Kingsmill Isl.

Leptocephalus sp. ?

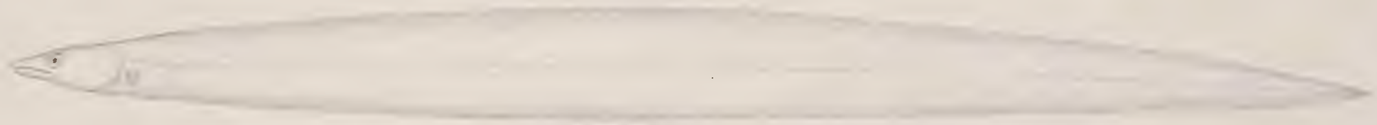
Body elongate, strongly compressed and
ribbon and transparent as glass so that
the whole internal organization is distinctly visible. The upper and lower outlines are nearly similar, both slightly convex, the greatest depth which is about the middle of the fish is compared to the total length, two to twenty seven. A median impressed line extends from the base of the head to the tip of the tail and the whole body is marked by oblique muscular bands. The head is very small, with a short and somewhat pointed snout. Branchial apertures just in advance of the minute pectorals. There are no visible dorsal or anal fins. The length of the head equals the greatest depth of the body, or entering thirteen times and a half in the total length. The small eyes are inserted immediately over the hinder angle of the mouth, which latter is edentate.

Length 8 inches.

Hab.— Permuda Isls.

420

Muræna pieta



Leptocephalus

421

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422

1. Hemitaeniata ~~fasciolatus, gen. et.~~

The depth of the body at the origin of the anal fin is one-nineteenth of the entire length. The snout is just midway between the tip of the snout and the end of the tail. The head, which is swollen on the occipital region, comprises one-fourth of the fish. The snout is short and rounded off. The eyes are situated exactly midway between the end of the snout and the hinder corner of the mouth. The jaws are even, and the slope of the mouth ~~which~~ reaches a little more than a third of the distance to the gill openings, which latter are below the median line of the body. Teeth acute, recurved, arranged in a single row in either jaw, and several inferior front canine or fang-like teeth.

Color everywhere, except the head and belly, profusely maculated and brindled with brown on a fulvous ground; the spots more or less confluent. Head brown. Belly cinereous. Sides orange. Fins edged with dark green.

Length, 12 to 18 inches.

Hab. tat. — Sandwich Isl. Society Isl. &c.

422

? Muraena thyrsidea

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beemmeri

Amarena c/n (789) 423

This Amarena is very much elongated, and very slender. The depth of the body over the rest, enters 4½ times in the total length, and the thickness at the same place equals a little more than half the above mentioned depth. The rest is anterior to the middle of the total length of the fish. The head is small, — measuring to the gill openings, — falls a little short of one-fifteenth of the entire length. The jaws are equal, rather blunt, and the small circular eye is inserted midway between the end of the jaws and the posterior angle of the mouth.

The fins are well developed, pointed posteriorly, the rays exceedingly fine, being scarcely visible through the in-

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tegument. The dorsal commences at a point just midway between the end of the snout and the gill openings

Color pale brown-grey, whitish along the belly, and the muzzle dotted with dark brown.

Length 20¾ inches.

Habitat.— Baiata Is.

Remarks.— This species is remarkable for its very slender form. The structure of the teeth are tubulate, recurved, with several anterior fangs and, as near as we can make out are disposed in single rows in either jaw. It is represented, and, as the natives informs one lives in the sand.??

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№ 3.

Muraena Commersii

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genus *Ichthyœcilia*, Garrett.

Form elongate, rather slender, compressed. Head large, mouth terminal. Pavement-like teeth on the vomer and maxillaries. Gill orifices as in *Etheostoma*, but the fissures are horizontal like fins. Tail rounded off.

This genus may be distinguished from *Ichthyopsis*, by their more robust form less tapering tail, more obtuse and shorter snout, and pavement-like teeth.

Ichthyœcilia zebra, Garrett.

The depth of this species as compared to the entire length is as one to twenty one. The mouth is situated at the commencement of the hinder third of the total length of the fish. The head is arched above, its length, measuring as usual to the gill orifices, is a little more than one tenth of the fish. The snout is short and the jaws are subequal. Eyes small, circ

outer, inserted rather nearer to the end of the snout than the dimples angle of the mouth. The premaxillary teeth are depressed, expanded, and disposed in bands.

Color rich chestnut brown, encircled with numerous, rather close pure white narrow rings, which are shaded off with blackish brown. On the head the rings are more or less irregular, broken and on the outer parts they present reticulations. On the end of the tail they are also broken up in irregularly disposed.

Two examples procured at the Kings mill Isls., had the rings yellow, and more or less forked.

Length, 1 feet 6 inches.

Habitat: Kings mill Isls. Society, Isls. Samoa Isls.

At the former locality the vernacular name is "Se-me-me" or "Se-mabe-mabe".

424

Muraena zebra

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425

Hemirhamphus ~~[illegible]~~ *nebulosa*.

This beautiful *Hemirhamphus* is considerably compressed, round the head considerably more than one fifth of the total length. The snout is triple nearly the length of the tail from the end of the snout. The depth of the body, in two eighteen or nineteen times in the entire length of the fish. The tail is lunate forcibly. The mouth is short and small. The upper jaw of the mouth extends one-third of the distance between the end of the snout and the hinder angle of the mouth. The upper jaw is slightly longer than the lower, and both furnished with fine cardiform teeth, disposed in a single row. The lower ones are longer than the upper, a canine in the anterior branch of the jaw, increasing in size backwardly, a few others are in front, very small. There are some of the teeth on either side of the upper

jaws and there exists on the inner
about the same number of about
conical ones of which the five mid-
dle ones are the largest. A double
row of small intermediate teeth on
the palate bones.

Color to life dark slate, and cream
white beneath. The markings which
are blackish brown, consist of five
rows of large irregular spots, the
lowermost forming a border the belly,
and all those on the flanks and sides
and shoulders with which yel-
low. They also spread over the fins
except the pectorals which are plain
dusky, white, and the belly is
closely dusted and dotted with the
same color as the large spots. The end
of the tail is bordered by a broad
white crescent and the dorsal fin with
orange. Iris blue black.

The throat commences in a groove
of the gill covers and the skull is
three pointed.

Length, 24 inches.

Habitat: Society Isles, Penrhyn Isles,
Samoa Isles, Kingsmill Isles and Viti Isles.

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425

Muræna nebulosa

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425

Thamnea ~~tenuicaudata~~ *xanthozopila*.

This species is natural, except the negative is shortened obtusely rounded. The depth of the body at the root of the tail is seven times in the total length, and the head comprises two fifteenth of the length. The snout is a little more than one half of the tail from the end of the mouth. The small circular eyes are situated just twice their own diameter from the root of the upper jaw and are a little nearer to the hinder corner of the mouth than the end of the snout. The tail is scarcely semilunar. The teeth are slender, somewhat depressed and in bands on the vomer, and in two irregular rows on each branch of the maxillaries in front the teeth are longer and those in the outer row are enlarged.

The first ray of the dorsal fin is short, the dorsal commencing at a point midway between the hinder angle of the mouth and the gill aperture.

Brown above, with a few indistinct yellow specks, which are mostly round, yellowish

striped and there along the lower part of breast and belly large and many irregular in shape. The specimen shows off with black bird of [illegible] Brown with a mixture of [illegible] rings.

Length 12 inches.

Habitat: Sumatra Isls.

Characterized by its robust form, short [illegible] and [illegible]

Muræna xanthospila

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Mormon bicolor, Guérin.

Skin of the Mormon has the scapular region considerably elevated, and the muzzle is short and obtuse. The upper jaw is the longer, and the gape of the mouth reaches one-third of the distance to the gill-pieces. The teeth are tuberculiform, longer in front, dispersed in two rows on the lower jaw. Those in the upper jaw are small, acute, and not extending so far back as those beneath. Lower jaw furnished with tuberculiform teeth. The front is intermediate between the end of the snout and the eye, which last is hence placed. The head comprises one eighth of the fish. Both fins are but little developed, and the dorsal commences far in advance of the gill-pieces. Color number eighteen. Irides orange. Fins edged with the latter color.

Length, 9 inches.

Habitat: Society Isles.

Unity in single specimen from the same Locality.

? *Muraena amblyodon*

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Muraena nana, Garrett.

This small Muraena is remarkable for its short obtuse muzzle and peculiar star-like markings. The head is conical, tapering, and constitutes one-eighth of the total length. The body is considerably compressed, and at the commencement of the anal fin the depth comprises about one seventeenth of the entire length of the fish. The vent is about midway between the end of the snout and the tip of the tail. The eyes are rather larger than usual, circular in shape, and their point of insertion is midway between the end of the snout and the hinder angle of the mouth. The upper jaw is a trifle the longer, and the gape of the mouth extends one third of the distance between the end of the snout and the gill openings.

The maxillary teeth are disposed in a single row in either jaw, much compressed, recurved, closely set so as to present a serrated appearance. Several of the anterior ones are stouter and less compressed. A single row of

both sexes, but the males are much larger.

The females are best distinguished by the dorsal scales being more elevated on the posterior portion of the body, and the last caudal scale but two forming a prominent spine.

The color of the living fish is yellowish white above, white beneath, and everywhere marked with numerous small stellated black spots.

Length 9 inches.

Habitat Society Isls.

I have also received after the above was in type, still smaller specimens of this little eel, all similarly marked, but differing in the exact disposition of the black spots.

269
429

Muraena leptocea, Gmelin.

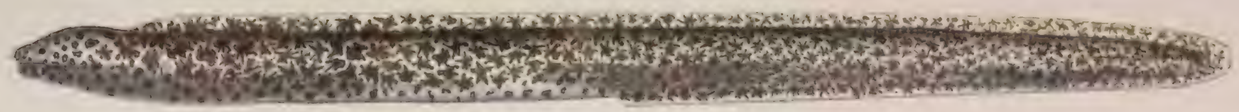
The general shape of this species is slender, and considerably compressed. The snout is just once the length of the head in advance of the middle of the entire length of the fish. The head, which comprises a tenth of the total length is but little elongated, and the muzzle is short and obtuse. The small round eyes are situated equi-distant between the tip of the snout and the end of the lower jaw. The maxillary teeth are subulate, somewhat unequal, closely set, directed inward and increasing in size. The larger canines are placed near the front, separated by a space corresponding nearly to the diameter of the eye, and have points.

Color yellowish gray, along the lower region, like black ink, and emerging upon the muzzle closely sprinkled with irregular small pale brownish spots. The fins have each a narrow pale bluish margin. Inside color yellowish white.

Length, 12 inches.

Habitat: Pacific Ocean.

429



Muraena

429

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Muraena mauritiana, Gmelt.

The head comprises two-thirds of the total length, and the muzzle is rather stout and blunt. The cleft of the mouth, which is a little nearer to the tip of the tail than to the tip of snout, is equal to one-thirdeenth of the entire length. The eyes are small, circular, and situated before the middle of their orbit from the tip of the snout. Teeth in a single row, rather stout, elongate, sacuminate and 11 or 12 in each side of either jaw. Also fangs. A single row of acute depressible teeth on the palatines. Vent low, somewhat behind the anal which is thick and seems more like a fold of the skin. The dorsal commences a little in advance of the gill orifices, which latter are on the median line.

Color greenish-yellow, everywhere marbled and reticulated with blackish-brown. Fins golden.

Length, 13 inches.

Habitat. - Seas near Isle.

Remarks. - I have seen but one example of this species. It may be distinguished by its rather stout aspect, and beautiful marbled markings.

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430

Muraena

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Genus *Ichthyophis*, Fitz.

Form much elongated, slender, slightly compressed, and without any vestiges of fins. The head is well developed, broad, and the snout is obtuse, subconical. Both jaws and vomer are furnished with slender subulate recurved teeth. Branchial apertures as in *Monopoma*.

The entire absence of fins and more tapering tail will distinguish these eels from the *Monopoma*. The more slender form and distinct teeth separate them from the closely allied genus *Ichthyeibia*. They are seldom used by the natives as an article of food. They are found lurking in holes and crevices in rocks, but have not the least poisonous disposition of the true *Monopoma*.

Ichthyoscion tigrinus, Cuv.

Ichthyoscion tigrinus, Cuv. & Val.
Hog. Cognetta,
p. 123, pl. 12.

The head, measuring to the gill pieces, enters thirteen times in the total length. The greatest depth of the body, as compared to the entire length, is as one to thirty. In the adult fish the head is very much swollen. The eye of the mouth extends one-third of the distance to the gill opening. Eyes small and situated, inserted on the middle of the length of the upper jaw. The tail tapers to a point. The anal is a little in advance of the posterior third of the fish.

Color pale brown, rather closely mottled but with scattered irregular dark brown or brown black spots. Inside pale flesh.

Length, from 3 to 4 feet.

Habitat: Secretly Lts.

The native name of this common species is "*Ima-pan-tac-ac*".

Gymnomurena Tigrina

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Ajeodes hi 442

This small eel was found lurking in branched coral, and may possibly be immature. It is slender, without fins and the depth at the vent enters 26 times in the total length, and the circumference at the same point is two-thirds the depth just alluded to. The vent is midway between the end of the snout and the tip of the tail. The head is but slightly swollen, comprising one-tenth of the fish, measuring from the gill openings, and the muzzle is obtuse.

Color pale grey, profusely macul-ated with large brown-black spots, smaller on the head. Muzzle finely fleck, immaculate.

Length 10 inches.

Hab. Society Isls.

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433

Gymnomuræna marmorata?

Echthrofelis marmoratus, Gunth

A specimen now before me, which has been a short time in spirit is cloudy mottled with different shades of brown on a very pale brownish ground. The depth taken at the front is as compared to the length one to twenty-four. The tail ends in a point. The head comprises one-twelfth of the total length.

Length, 2 to 3 feet.

Habitat: Pinang Isle.

At the above location this species is very abundant, under stones on the shore reefs. I remarked it as very conspicuous together.

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433

Gymnomuræna marmorata?

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Gymnomuraena macrocephala?

Ichthyophis hieroglyphicus, Garman

This species has the head much smaller, the upper lips rising from the snout with a sudden curve. The greatest depth of the body not contained in the total length six and one to seven times. The tail tapers to a point. The vent is a little posterior to the middle of the length. The eyes are small, circular and a trifle nearer the end of the jaw than the angle of the mouth, which latter extends one third of the distance to the gill-openings.

Color uniform dark chocolate brown, becoming black with posterior, and everywhere marked with small light from colored markings which somewhat resemble warlike characters, hence light blotches.

Length 12 inches.

Habitat: Sandwich Isls.

Of the above location, there it is evident "Wilkes" obtained a single specimen. The peculiar markings suggest the specific name.

Gymnomuræna macrocephala?

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Sub the specific characters, [illegible]

This species is very closely allied to the [illegible], but differing much in the form of the head, and the comparative size of the teeth, and the upper lobe of the anal. The depth of the body is about one-seventh of the total length. The head is nearly [illegible] and about as long as the fish, and is but little shorter. The mouth is small, very much toplessing, and the eye of the mouth extends a little more than half way to the gill opening. The eyes are small and are situated rather nearer to the end of the snout than the hind margin of the mouth. The anterior dorsal, pectoral, ventral & the two anterior rays of the anal long, and the external ones nearly as long as the middle. The anal is a little in advance of the middle of the total length.

Color olivaceous brown, freckled on the abdominal region, and profusely with the [illegible] fins.

Length, 3 inches.

Habitat: Society Is.

Symmoniraena

275

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Gymnomuraena sp.?

Ichthyophis annicolor, Garrett.

This species is much more slender than I. glutinosa or I. kohtaoensis. The head is also less stouter, and comprises one-fourteenth of the fish. The vent is at the commencement of the fore-one third. The greatest depth of the body enters thirty-nine times in the total length. The tail tapers to a point.

Color uniform dark sooty brown.

Habitat: Society Isls.

Obtained in exchange example of this interesting species at the above mentioned locality.

Gymnomuræna sp?

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Dorychthys sp.?

308

457

Syngnathus [illegible]

L. 2½; l. ⅛; t. ⅛.

The head is [illegible] of the total length and the eyes are [illegible] above the upper line of the head and is a little nearer the hinder margin of the opercle than the end of the snout. The opercular bones are enameled and the cheek radiating lines. The upper line of the muzzle is armed with a stout spine, the larger ones compressed, obtuse, and a single one on the lower line near the end of the snout. The body is rather slender, and the plates are closely jointed and thin just over each with a strongly recurved acute spine. There may be counted 18 plates between the base of the pectoral and vent, and 15 posterior to the latter organ.

The fin is partly broken, rises over the plates and is composed of simple articulate rays. The pectorals are broad, rounded on their hinder margins and composed of reticulate branched rays. The large caudal is rounded behind and the rays are like those of the other fins.

The color of the living fish is dark blue. The top of the head in the male is purple brown, of pale yellow line between the dorsal region from the end of the snout to the throat, the sides brown, caudal brown black margined with white. The other fins colorless.

Length, 2½ inches. Neb— Society Isls. (Rau)

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Doryichthys sculptus

Syngnathus No. 809

D. 29 in 30; P. 8; C. 10.

A male with ova now before me was captured in April. Length 2¾ inches.

Color wood brown inclined to reddish brown along the dorsal region, which latter portion is trilineated with three rows of elongate dusky dots. Two longitudinal rows of silvery white dots above the pectorals, the dots enclosed in dark rings. Two dusky longitudinal lines in the occipital region, two extend backward from the eye, the lower one cutting the eye and extending to the end of the snout. Cheeks minutely punctured, white. Irides pale brown. Caudal brown, the other fins colorless.

The body is rather stout, the upper line gently convex from the interocular space to the end of the caudal fin. The ventral line is nearly horizontal. The eye is circular, touching the upper line of profile, and placed a trifle nearer the opercular margin than the end of the snout. The head comprises one-sixth of the total length. Two small contiguous blunt spines just in advance of the eye. 20 plates can be counted between the head and the end of the dorsal fin and 22 from the latter point to the base of the caudal. The plates are sculptured with raised reticulated lines. The upper angles salient and become more and more pungent in their hinder portions posteriorly. Sides compressed with a salient median angle which under the dorsal curves downward and forms the

lower angle of the long caudal trunk. Above and beneath the median lateral angle is a small series of ridges the lower one terminating at the end of the body and the upper one extends to the base of the caudal fin.

The dorsal fin passes over seven ~~plates~~, gently arched above, the pectorals concave on their posterior margin, and the caudal rounded.

Hab.— Society Isls.

311, 312.
440

hystrix
Hystrix ~~Ken Hound~~ 312.

D. 17; P. 18 A. 4; (female)

The male fish is light olive brown, closely and minutely punctured with white, everywhere except the rostrum, upper posterior part of the neck, paunch and hinder half of tail. On the sides above the abdominal region may be seen yellow vermicular lines. Several yellowish white transverse lines on the rostrum. Paunch dull green. Abdominal keel edged with black and the dorsal spines tipped with the same hue. A dusky shade at the end of the snout, between the eyes and on the cheeks. Irides olive brown with radiating white lines. Pectorals colorless. The dorsal with two longitudinal blackish lines.

The female is rather lighter colored than the male and some exhibit faint transverse bars on the body.

The head comprises about one fifth of the total length, measuring from the tip of the rostrum to the tip of the tail, when extended in a linear line. The specimen now before me a female measures in the above line 5¼ inches. The snout is long and slender, being longer than the head, that is measuring from the tip to the anterior limit of the orbit. The circular eye enters six times in the length of the head, rostrum included. The occipital crest consists of an anterior well developed spine directed horizontally, posteriorly and contiguous may be seen a tubercle and a quadrispinous knob. The

upper limb of the orbit

× is furnished with a stout spine, one between the nostrils directed forward, one behind the eye, three on the side of the head, two small ones on the lower base of the rostrum and the nape with a trispinous crest. A single spine on the middle of the second dorsal segment. The spinous processes on the body are well developed alternately larger and smaller, and reduced to compressed knobs on the abdominal keel.

From the base of the head to the base of the tail we count 10 segments, and 35 on the tail

~~The body is six-angled and the tail four~~

Hab.— Society Isls.

Synagnathus conspicillatus No 310 conspicill 439

Having mislaid my Notes on this species I must refer to the many specimens sent you and to the figure for color.

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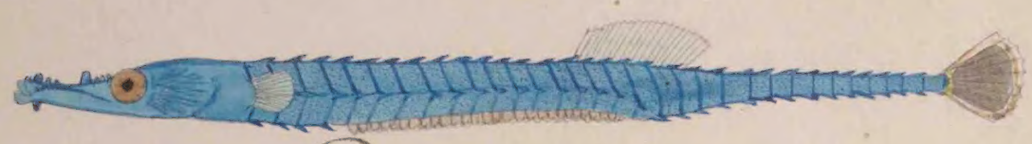
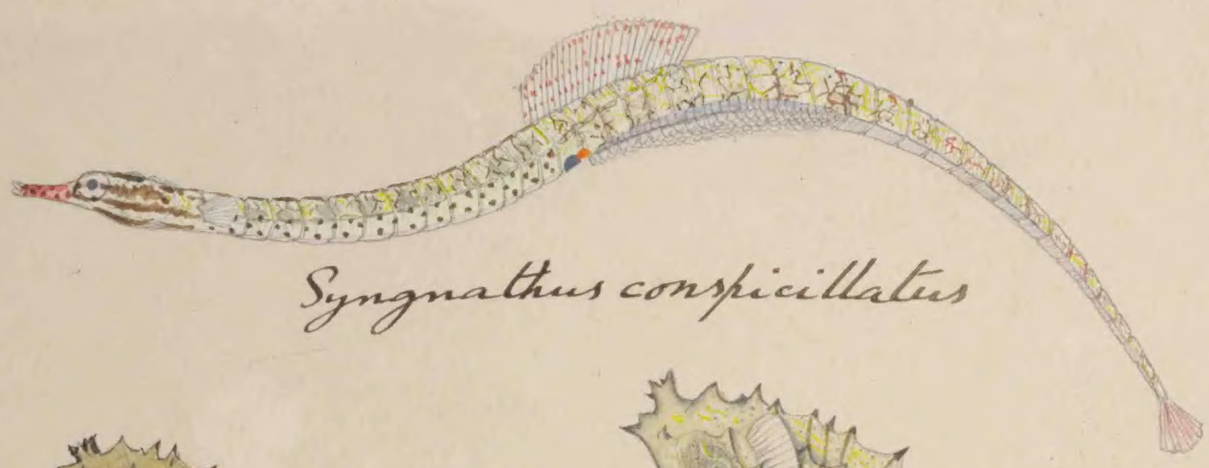


Doryichthys sp.

437
308

Doryichthys sculptus

309
438



Syngnathus conspicillatus

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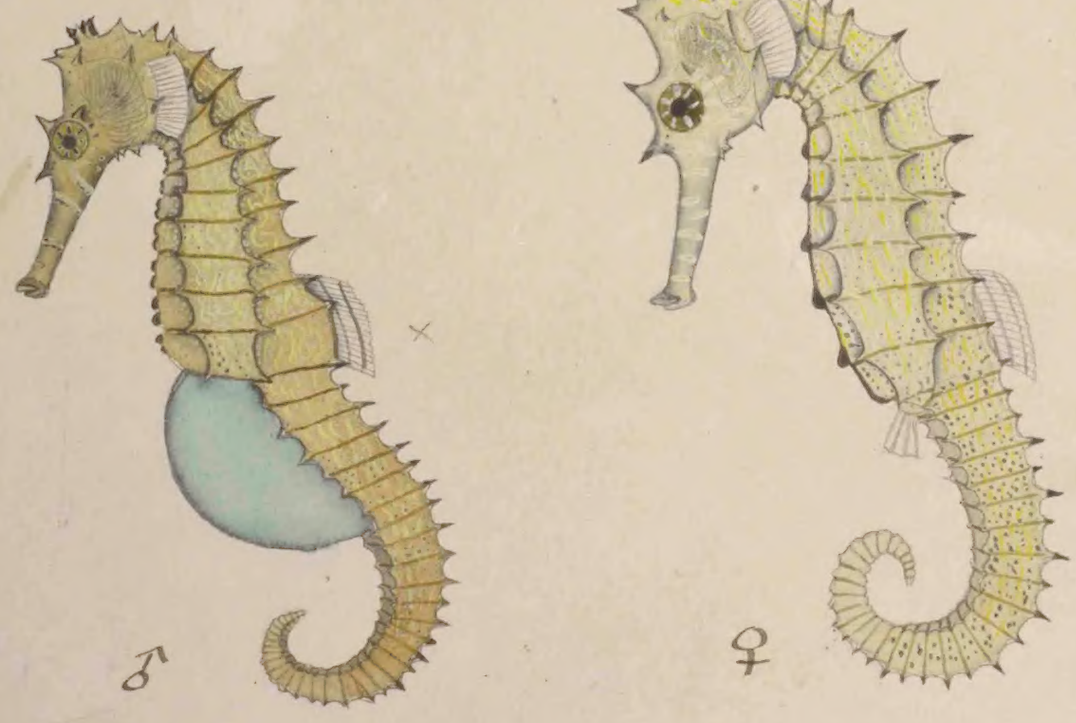

Hippocampus hystrix

441

311
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